

Cloud Computing Occupations 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 Cloud Computing 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 14,638 students in the Bay region and 1,398 students in the East Bay Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0707.00 - Computer Software Development 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 Cloud Computing Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Las Positas College.

- **Computer Programmers (SOC 15-1131):** 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%
- **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%
- **Software Developers, Systems Software (SOC 15-1133):** Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. May design embedded systems software. Apply principles and techniques of computer science, engineering, and mathematical analysis.
Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None

Occupational Demand

Table 1. Employment Outlook for Cloud Computing Occupations in Bay Region

Occupation	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Openings	Average Annual Openings	10% Hourly Wage	Median Hourly Wage
Computer Programmers	11,818	12,612	794	7%	4,733	947	\$29.07	\$49.77
Software Developers, Applications	93,606	113,716	20,110	21%	52,603	10,521	\$39.30	\$63.42
Software Developers, Systems Software	45,812	49,633	3,821	8%	18,884	3,777	\$42.43	\$67.13
Total	151,236	175,960	24,724	16%	76,219	15,244	\$39.45	\$63.48

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 Cloud Computing Occupations in East Bay Sub-Region

Occupation	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	5-Yr Openings	Average Annual Openings	10% Hourly Wage	Median Hourly Wage
Computer Programmers	2,176	2,145	-32	-1%	694	139	\$26.27	\$44.40
Software Developers, Applications	12,167	13,512	1,345	11%	5,377	1,076	\$35.27	\$59.42
Software Developers, Systems Software	5,711	5,918	207	4%	2,042	408	\$38.41	\$57.98
TOTAL	20,055	21,574	1,520	8%	8,113	1,623	\$35.19	\$57.38

Source: EMSI 2019.2

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 (November 2018 - October 2019)

Occupation	Bay Region	East Bay
Software Developers, Applications	129,779	16,909
Computer Programmers	5,496	1,046
Software Developers, Systems Software	1,516	287
Total	136,791	18,242

Source: Burning Glass

Table 4a. Top Job Titles for Cloud Computing Occupations for latest 12 months (November 2018 - October 2019) Bay Region

Common Title	Bay	Common Title	Bay
Software Development Engineer	36,190	Engineer	1,239
Java Developer	10,097	.Net Developer	1,169
Devops Engineer	4,822	Salesforce Developer	1,034
Software Developer	3,797	Software Engineering Manager	990
Applications Engineer	3,409	Senior Engineer	938
Java Engineer	2,845	Software Architect	800
Python Developer	2,421	Full Stack Developer	798
Senior Developer	2,037	C++ Developer	700
Android Developer	2,028	Full Stack Engineer	699
Developer	2,007	Oracle Developer	655
Applications Developer	1,613	Programmer/Analyst	609

Principal Software Engineer	1,439	Business Intelligence Developer	605
Senior Devops Engineer	1,317	Lead Developer	586
iOS Developer	1,315	Solutions Engineer	566

Table 4b. Top Job Titles for Cloud Computing Occupations for latest 12 months (November 2018 - October 2019) East Bay Sub-Region

Common Title	East Bay	Common Title	East Bay
Software Development Engineer	3,755	Oracle Developer	149
Java Developer	1,520	Salesforce Developer	141
Devops Engineer	837	Senior .Net Developer	140
Software Developer	614	Principal Software Engineer	135
Applications Engineer	470	Business Intelligence Developer	128
.Net Developer	434	Lead Developer	123
Developer	328	Engineer	122
Senior Developer	300	Full Stack Developer	106
Java Engineer	284	Junior Software Engineer	105
Applications Developer	277	iOS Developer	102
Senior Devops Engineer	205	Software Architect	97
Android Developer	200	Sharepoint Developer	97
Python Developer	197	Java/J2EE Developer	94
Programmer/Analyst	183	Build Release Engineer	93

Source: Burning Glass

Industry Concentration

Table 5. Industries hiring Cloud Computing 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)	32,012	38,178	19%	21%
Computer Systems Design Services (541512)	20,189	23,227	15%	13%
Software Publishers (511210)	17,548	22,230	27%	12%
Internet Publishing and Broadcasting and Web Search Portals (519130)	15,406	20,377	32%	10%
Electronic Computer Manufacturing (334111)	14,328	15,810	10%	9%
Data Processing, Hosting, and Related Services (518210)	6,106	7,964	30%	4%
Other Computer Related Services (541519)	4,190	5,168	23%	3%
Corporate, Subsidiary, and Regional Managing Offices (551114)	3,436	3,757	9%	2%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715)	2,350	2,559	9%	2%
Semiconductor and Related Device Manufacturing (334413)	2,081	1,960	-6%	1%
Engineering Services (541330)	1,790	1,962	10%	1%

Source: EMSI 2019.2

Table 6. Top Employers Posting Cloud Computing Occupations in Bay Region and East Bay Sub-Region (November 2018 - October 2019)

Employer	Bay	Employer	Bay	Employer	East Bay
Apple Inc.	1,932	Verizon Communications Inc	281	Workday, Inc	429
Amazon	1,252	Intel Corporation	281	Scoop Technologies	308
Cisco Systems Incorporated	1,139	Adobe Systems	279	Ellie Mae	80
Scoop Technologies	1,006	Google Inc.	273	Kaiser Permanente	78
Facebook	615	Splunk	267	Oracle	76
Oracle	608	Xoriant Incorporated	258	General Electric Company	72

Workday, Inc	599	Splunk, Inc	248	The Nielsen Company	71
IBM	461	Accenture	247	Albertsons	71
SAP	408	Intelliswift Software	230	NTT Data	69
Paypal	358	Neuvo Usa	228	Lucid Motors Inc	69
Visa	350	eBay	226	Perficient Incorporated	68
Walmart / Sam's	349	Twitter	199	Tesla	65
Salesforce	337	Vmware Incorporated	195	Tesla Motors	58
Wipro	319	Jobot	193	Safeway Incorporated	52
Microsoft Corporation	306	Amazon Lab126	190	Oakland Unified School District	52
Uber	288	Xilinx Incorporated	187	Jarvis Cole, Inc	50
Intuit	285	AppDynamics	185	Synergisticit	49

Source: Burning Glass

Educational Supply

There are 16 community colleges in the Bay Region issuing 606 awards on average annually (last 3 years) on TOP 0707.00 - Computer Software Development and TOP 0707.10 Computer Programming. There are five colleges in the East Bay Sub-Region issuing 225 awards on average annually (last 3 years) on these two TOP codes.

Table 7. Awards on TOP 0707.00 - Computer Software Development and TOP 0707.10 - Computer Programming in Bay Region

College	Sub-Region	TOP Code	Associates	Certificate 18+ units	Certificate Low unit	Total
City College of San Francisco	Mid-Peninsula	70700			1	1
College of San Mateo	Mid-Peninsula	70700	8	10	72	90
Solano College	North Bay	70700			3	3
Berkeley City College	East Bay	70710	2	2	2	6
Cabrillo College	Santa Cruz - Monterey	70710	4	7	10	21
City College of San Francisco	Mid-Peninsula	70710		24	40	64
College of San Mateo	Mid-Peninsula	70710	1		2	3
Contra Costa College	East Bay	70710	1	0	-	1
De Anza College	Silicon Valley	70710	9	2	32	43
Diablo Valley College	East Bay	70710	68		144	212
Gavilan College	Santa Cruz - Monterey	70710	9	5		14
Hartnell College	Santa Cruz - Monterey	70710	27	2		29
Laney College	East Bay	70710	3	-	1	4
Las Positas College	East Bay	70710	1	1		2
San Jose City College	Silicon Valley	70710	5	9		14
Solano College	North Bay	70710	4	1		5
City College of San Francisco	Mid-Peninsula	70700			1	1
College of San Mateo	Mid-Peninsula	70700	8	10	72	90
Solano College	North Bay	70700			3	3
Total Bay Region			150	73	383	606
Total East Bay Sub-Region			75	3	147	225

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 15,244 annual openings for the Cloud Computing occupational cluster and 606 annual (3-year average) awards on two TOP codes for an annual undersupply of 14,638 students. In the East Bay Sub-Region, there is also a gap with 1,623 annual openings and 225 annual (3-year average) awards on two TOP codes for an annual undersupply of 1,398 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0707.00 - Computer Software Development

2015-16	Bay (All CTE Programs)	Las Positas College (All CTE Programs)	State (0707.00)	Bay (0707.00)	East Bay (0707.00)	Las Positas College (0707.00)
% Employed Four Quarters After Exit	74%	75%	62%	59%	n/a	n/a
Median Quarterly Earnings Two Quarters After Exit	\$10,550	\$10,000	\$12,500	\$14,169	n/a	n/a
Median % Change in Earnings	46%	28%	54%	37%	n/a	n/a
% of Students Earning a Living Wage	63%	64%	67%	68%	n/a	n/a

Source: Launchboard Pipeline (version available on 11/4/19)

Skills, Certifications and Education

Table 9. Top Skills for Cloud Computing Occupations in Bay Region (November 2018 - October 2019)

Skill	Postings	Skill	Postings	Skill	Postings
Java	56,478	Scrum	10,706	Extensible Markup Language (XML)	8,100
Software Engineering	51,706	Continuous Integration (CI)	10,680	Machine Learning	7,848
Software Development	38,057	Data Structures	10,642	Relational Databases	7,775
Python	37,093	NoSQL	10,594	JavaScript Object Notation (JSON)	7,748
SQL	29,563	UNIX	10,470	Big Data	7,744
JavaScript	29,024	Web Application Development	10,266	React Javascript	7,694
Linux	22,250	Agile Development	9,756	Apache Hadoop	7,590
C++	21,944	Docker Software	9,435	Salesforce	7,390
Git	16,770	MySQL	9,334	Project Management	7,241
DevOps	15,986	Microsoft C#	9,291	Node.js	6,973
Debugging	15,088	Software Architecture	8,933	Ruby	6,841
Object-Oriented Analysis and Design (OOAD)	14,604	Quality Assurance and Control	8,849	HTML5	6,772
Oracle	13,457	Apache Kafka	8,753	Product Development	6,531
Unit Testing	12,446	AngularJS	8,454	Product Management	6,344
Kubernetes	11,007	Scalability Design	8,447	PostgreSQL	6,299

Source: Burning Glass

Table 10. Certifications for Cloud Computing Occupations in Bay Region (November 2018 - October 2019)

Note: 95% 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	2,110	Cisco Certified Network Professional (CCNP)	196
IT Infrastructure Library (ITIL) Certification	688	SANS/GIAC Certification	185
Driver's License	403	CompTIA Security+	167
Certified Salesforce Platform Developer	347	Certified Salesforce Advanced Administrator	122
Project Management Certification	326	Certified Salesforce Platform Developer I	119
Salesforce Developer	322	Project Management Professional (PMP)	105

Certified Information Systems Security Professional (CISSP)	310	Salesforce Platform App Builder	103
Cisco Certified Network Associate (CCNA)	247	Certified Information Systems Auditor (CISA)	100
ITIL Certification	231	Mbe Certified	98
Cisco Certified Internetwork Expert (CCIE)	221	Certified ScrumMaster (CSM)	94
Certified Salesforce Platform Developer II	219	Certified Salesforce Advanced Developer	87
Certified Salesforce Administrator	207	Certified Scrum Professional (CSP)	79

Source: Burning Glass

Table 11. Education Requirements for Cloud Computing 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	849	1%
Associate Degree	400	1%
Bachelor's Degree or Higher	65,341	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/
 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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