



Cybersecurity Occupations Labor Market Information Report Foothill 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 an “undersupply” of Cybersecurity 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 4,277 students in the Bay region and 1,678 students in the Silicon Valley Sub-Region.

Introduction

This report provides student outcomes data on employment and earnings for TOP 0708.00 - Computer Infrastructure and Support 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 Foothill College and in the region.

This report profiles Cybersecurity Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Foothill College.

- **Computer and Information Systems Managers (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%
- **Information Security Analysts (15-1212):** Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. May respond to computer security breaches and viruses. Excludes “Computer Network Architects” (15-1143).
Entry-Level Educational Requirement: Bachelor’s degree
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 27%

Occupational Demand

Table 1. Employment Outlook for Cybersecurity Occupations in Bay Region

Occupation	2019 Jobs	2024 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Computer and Information Systems Managers	38,017	41,772	3,755	10%	19,146	3,829	\$ 73.85	\$ 91.71
Information Security Analysts	3,714	4,835	1,121	30%	2,595	519	\$ 44.51	\$ 59.46
Total	41,731	46,607	4,876	12%	21,741	4,348	\$71.24	\$88.84

Source: EMSI 2020.4

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 Cybersecurity Occupations in Silicon Valley Sub-region

Occupation	2019 Jobs	2024 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Computer and Information Systems Managers	15,012	16,431	1,419	9%	7,485	1,497	\$ 77.52	\$ 95.17
Information Security Analysts	1,284	1,680	396	31%	906	181	\$ 46.94	\$ 63.77
Total	16,296	18,111	1,815	11%	8,391	1,678	\$75.11	\$92.70

Source: EMSI 2020.4

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 (Mar 2020 - Feb 2021)

Occupation	Bay Region	Silicon Valley
Information Security Analysts	7,577	112
Computer and Information Systems Managers	1,951	49

Source: Burning Glass

Table 4a. Top Job Titles for Cybersecurity Occupations for latest 12 months (Mar 2020 - Feb 2021) Bay Region

Title	Bay	Title	Bay
Security Engineer	277	Chief Technology Officer	61
Senior Security Engineer	135	Director, Software Engineering	52
Information Security Engineer	115	IT Security Analyst	47
Security Analyst	114	Cyber Security Engineer	45
Information Security Analyst	80	Senior Cloud Security Engineer	40
Network Security Engineer	76	IT Security Specialist	37
Cloud Security Engineer	75	Security Operations Engineer	32
Cyber Security Analyst	68	Penetration Tester	31
Security Architect	64	Chief Information Officer	31

Source: Burning Glass

Table 4b. Top Job Titles for Cybersecurity Occupations for latest 12 months (Mar 2020 - Feb 2021) Silicon Valley Sub-Region

Title	Silicon Valley	Title	Silicon Valley
Director Of IT	7	Director, Center Of Technology	3
Information Systems Security Officer Isso	5	Cyber Security Engineer	3
Chief Technology Officer	5	Technology Director	2
Security Analyst	4	Sterility Assurance Leader/Specialist Remote	2
Director Of Information Technology	4	Senior IT Internal Auditor	2
IT Security Analyst	3	Senior IT Director - Brm Coronary & Renal Denervation And Cardiac Surgery	2
Information Security Engineer	3	Senior Information Security Engineer	2
Information Security Consultant, Identity And Access Management	3	Security Network Engineer	2
Information Security Analyst	3	IT Director	2

Source: Burning Glass

Industry Concentration

Table 5. Industries hiring Cybersecurity 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	7,950	9,461	19%	19%
Computer Systems Design Services	4,558	5,127	12%	11%
Internet Publishing and Broadcasting and Web Search Portals	3,623	4,379	21%	9%
Software Publishers	3,325	4,180	26%	8%
Corporate, Subsidiary, and Regional Managing Offices	2,374	2,236	-6%	5%
Data Processing, Hosting, and Related Services	1,770	2,253	27%	4%
Electronic Computer Manufacturing	1,251	1,413	13%	3%
Other Computer Related Services	1,139	1,459	28%	3%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	902	1,020	13%	2%
Local Government, Excluding Education and Hospitals	721	747	4%	2%

Source: EMSI 2020.4

Table 6. Top Employers Posting Cybersecurity Occupations in Bay Region and Silicon Valley Sub-Region (Mar 2020 - Feb 2021)

Employer	Bay	Employer	Silicon Valley
Wells Fargo	198	Capital One	10
Palo Alto Networks	184	Accion Labs	7
Cisco Systems Incorporated	153	Wells Fargo	5
Splunk	139	General Dynamics	5
Facebook	109	Ultragenyx Pharmaceutical	4
IBM	106	Thermo Fisher Scientific Inc	4
Salesforce	90	Lockheed Martin Corporation	4

Employer	Bay	Employer	Silicon Valley
KPMG	88	Biomarin Pharmaceutical Incorporated	4
Deloitte	84	Sonoma State University	3
Accenture	83	CrowdStrike	3

Source: Burning Glass

Educational Supply

There are three (3) community colleges in the Bay Region issuing 71 awards on average annually (last 3 years ending 2018-19) on TOP 0708.00 - Computer Infrastructure and Support. In the Silicon Valley Sub-Region, there are no community colleges issuing awards on average annually (last 3 years) on this TOP code.

Table 7. Community College Awards on TOP 0708.00 - Computer Infrastructure and Support in Bay Region

College	Subregion	Associate	Certificate Low	Total
Los Medanos	East Bay	6	5	11
Ohlone	East Bay	0	1	1
San Francisco	Mid-Peninsula	46	13	59
Total		52	19	71

Source: Data Mart

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

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 4,348 annual openings for the Cybersecurity occupational cluster and 71 annual (3-year average) awards for an annual undersupply of 4,277 students. In the Silicon Valley Sub-Region, there is also a gap with 1,678 annual openings and no annual (3-year average) awards for an annual undersupply of 1,678 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0708.00 - Computer Infrastructure and Support

Metric Outcomes	Bay All CTE Program	Foothill All CTE Program	State 0708.00	Bay 0708.00	Silicon Valley 0708.00	Foothill 0708.00
Students with a Job Closely Related to Their Field of Study	75%	88%	69%	73%	77%	N/A
Median Annual Earnings for SWP Exiting Students	\$44,574	\$63,205	\$45,276	\$52,482	\$61,093	\$76,521
Median Change in Earnings for SWP Exiting Students	31%	63%	21%	26%	19%	19%
Exiting Students Who Attained the Living Wage	52%	67%	64%	57%	64%	77%

Source: Launchboard Strong Workforce Program from version 2017-18.

Skills, Certifications and Education

Table 9. Top Skills for Cybersecurity Occupations in Bay Region (Mar 2020 - Feb 2021)

Skill	Posting	Skill	Posting
Information Security	3,547	Software as a Service (SaaS)	817
Python	2,121	Customer Service	802
Linux	1,622	Authentication	775

Skill	Posting	Skill	Posting
Software Development	1,502	C++	763
Information Systems	1,420	Kubernetes	756
Network Security	1,310	Business Process	743
Project Management	1,295	Threat Modeling	732
Java	1,268	Splunk	708
Software Engineering	1,253	Good Clinical Practices (GCP)	673
Cryptography	1,212	Threat Analysis	673
Penetration Testing	946	Health Insurance Portability and Accountability Act (HIPAA)	651
Security Operations	915	JavaScript	620
DevOps	906	Product Management	610
Budgeting	844	UNIX	609

Source: Burning Glass

Table 10. Certifications for Cybersecurity Occupations in Bay Region (Mar 2020 - Feb 2021)

Certification	Posting	Certification	Posting
Certified Information Systems Security Professional (CISSP)	1,858	Cisco Certified Security Professional	210
Certified Information Systems Auditor (CISA)	921	Project Management Certification	185
Certified Information Security Manager (CISM)	807	GIAC Certified Incident Handler (GCIH)	179
SANS/GIAC Certification	730	GIAC Security Essentials Certification	168
Information Systems Certification	539	Cisco Certified Network Professional (CCNP)	128
Certified in Risk and Information Systems Control	344	GIAC Certified Intrusion Analyst	123
CompTIA Security+	296	Driver's License	120
Security Clearance	279	Project Management Professional (PMP)	105
IT Infrastructure Library (ITIL) Certification	229	Certified Ethical Hacker (CEH)	99
Cisco Certified Network Associate (CCNA)	226	Systems Security Certified Practitioner (SSCP)	83

Source: Burning Glass

Note: 68% 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.

Table 11. Education Requirements for Cybersecurity Occupations in Bay Region

Education (minimum advertised)	Latest 12 Mos. Postings	Percent 12 Mos. Postings
High school or vocational training	348	6%
Associate's degree	85	1%
Bachelor's degree	5,036	87%
Master's degree and higher	335	6%

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 CCCCCO 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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