



Labor Market Analysis for Program Recommendation Information Security Occupations Cabrillo College

Prepared by the San Francisco Bay Center of Excellence for Labor Market Research

October 2023

Recommendation

Based on all available data, there appears to be an “undersupply” of Information Security workers compared to the demand for this cluster of occupations in the Bay region and in the SC-Monterey sub-region (Monterey, San Benito, Santa Cruz counties). There is a projected annual gap of about 1,504 students in the Bay region and 16 students in the SC-Monterey 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 Cabrillo College and in the region.

This report profiles Information Security Occupations in the 12 county Bay region and in the SC-Monterey sub-region for a proposed new Security Certificate program at Cabrillo College.

- 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 Information Security Occupations in Bay Region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Information Security Analysts	12,469	15,351	2,883	23%	7,783	1,557	\$59	\$67
Total	12,469	15,351	2,883	23%	7,783	1,557	\$59	\$67

Source: Lightcast 2022.3

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 Information Security Occupations in SC-Monterey Sub-region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Information Security Analysts	144	169	25	17%	81	16	\$46	\$58
Total	144	169	25	17%	81	16	\$46	\$58

Source: Lightcast 2022.3

SC-Monterey Sub-Region includes: Monterey, San Benito, Santa Cruz Counties**Job Postings in Bay Region and SC-Monterey Sub-Region****Table 3. Number of Job Postings by Occupation for latest 12 months (Sept. 2022 - Aug. 2023)**

Occupation	Bay Region	SC-Monterey
Information Security Analysts	5,057	117

Source: Lightcast

**Table 4a. Top Job Titles for Information Security Occupations for latest 12 months (Sept. 2022 - Aug. 2023)
Bay Region**

Title	Bay	Title	Bay
Security Engineers	423	IT Auditors	82
Cloud Security Engineers	153	Cloud Security Architects	79
Information Security Analysts	120	Cybersecurity Analysts	73
Cybersecurity Engineers	108	Cyber Threat Analysts	68
Product Security Engineers	106	Cybersecurity Managers	66
Security Analysts	101	IT Security Analysts	64
Security Software Engineers	101	Information Security Managers	63
Network Security Engineers	86	Security Researchers	61
Security Architects	83	Staff Security Engineers	52

Source: Lightcast

**Table 4b. Top Job Titles for Information Security Occupations for latest 12 months (Sept. 2022 - Aug. 2023)
SC-Monterey Sub-Region**

Title	SC-Monterey	Title	SC-Monterey
IT Information Security Specialists	10	IT Supervisors	3
Physical Security Analysts	10	Security Analysts	3
Information Security Specialists	9	Security Engineers	3
Information Security Analysts	6	Vulnerability Analysts	3
Cosmetologists	5	Cloud Security Engineers	2

Title	SC-Monterey	Title	SC-Monterey
Cybersecurity Analysts	4	Cybersecurity Managers	2
Cybersecurity Engineers	4	Cybersecurity Specialists	2
Cybersecurity Program Managers	4	Data Security Analysts	2
Cloud Security Architects	3	Ethical Hackers	2

Source: Lightcast

Industry Concentration

Table 5. Industries hiring Information Security Workers in Bay Region

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2021)	Jobs in Industry (2026)	% Change (2021-26)	% Occupation Group in Industry (2022)
Custom Computer Programming Services	1,622	1,957	21%	19%
Web Search Portals and All Other Information Services	2,458	1,088	-56%	10%
Computer Systems Design Services	857	911	6%	10%
Data Processing, Hosting, and Related Services	365	650	78%	6%
Corporate, Subsidiary, and Regional Managing Offices	412	404	-2%	5%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	341	458	34%	5%
Software Publishers	302	385	27%	4%
Research and Development in Biotechnology (except Nanobiotechnology)	213	275	29%	2%
Commercial Banking	169	212	26%	2%
Other Computer Related Services	225	220	-2%	2%

Source: Lightcast 2022.3

Table 6. Top Employers Posting Information Security Occupations in Bay Region and SC-Monterey Sub-Region (Sept. 2022 - Aug. 2023)

Employer	Bay	Employer	SC-Monterey
Cisco	120	University of California	13
Palo Alto Networks	102	Deloitte	10
Capital One	97	Arctic Slope Regional Corporation	5
Apple	82	Koniag	5
Wells Fargo	78	Acord	4
Federal Reserve Bank	75	Moss Adams	4

Source: Lightcast

Educational Supply

There are three (3) community colleges in the Bay Region issuing 40 awards on average annually (last 3 years ending 2021-22) on TOP 0708.00 - Computer Infrastructure and Support. In the SC-Monterey Sub-Region, there are no community colleges that issued awards on average annually (last 3 years) on this TOP code.

There is one (1) other CTE educational institutions in the Bay Region issuing 13 awards on average annually (last 3 years ending 2021-22) on CIP 11.1001 - Network and System Administration/Administrator. There are no other CTE educational institution in the SC-Monterey Sub-Region issuing awards on average annually (last 3 years) on this CIP code.

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

College	Subregion	Associate Degree	Low unit Certificate	Total
Foothill	Silicon Valley	0	1	1
Los Medanos	East Bay	7	0	7
San Francisco	Mid-Peninsula	22	10	32
Total		29	11	40

Source: Data Mart

Note: The annual average for awards is 2019-20 to 2021-22.

Table 7b. Other CTE Institutions Awards on CIP 11.1001 - Network and System Administration/Administrator in Bay Region

College	Subregion	Associate degree	Total
Empire College	North Bay	13	13
Total		13	13

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 1,557 annual openings for the Information Security occupational cluster and 53 annual (3-year average) awards for an annual undersupply of 1,504 students. In the SC-Monterey Sub-Region, there is also a gap with 16 annual openings and no annual (3-year average) awards for an annual undersupply of 16 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 Programs	Cabrillo All CTE Programs	State 0708.00	Bay 0708.00	SC-Monterey 0708.00	Cabrillo 0708.00
Students with a Job Closely Related to Their Field of Study	74%	80%	71%	71%	71%	71%
Median Annual Earnings for SWP Exiting Students	\$53,090	\$46,381	\$52,790	\$65,192	\$54,475	\$54,475
Median Change in Earnings for SWP Exiting Students	24%	23%	17%	16%	10%	10%
Exiting Students Who Attained the Living Wage	54%	44%	64%	61%	51%	51%

Source: Launchboard Strong Workforce Program Median of 2018 to 2021.

Skills, Certifications and Education

Table 9. Top Skills for Information Security Occupations in Bay Region (Sept. 2022 - Aug. 2023)

Skill	Posting	Skill	Posting
Computer Science	1,700	Network Security	748
Cyber Security	1,633	Firewall	722
Vulnerability	1,348	Cloud Security	718
Auditing	1,260	Risk Management	718
Python (Programming Language)	1,175	Operating Systems	693
Amazon Web Services	1,048	Microsoft Azure	692
Automation	880	Project Management	664
Security Controls	851	Linux	641
Risk Analysis	850	Penetration Testing	641
Incident Response	788	Scripting	584

Source: Lightcast

Table 10. Certifications for Information Security Occupations in Bay Region (Sept. 2022 - Aug. 2023)

Certification	Posting	Certification	Posting
Certified Information Systems Security Professional	1,209	Certified Internal Auditor	153
Certified Information System Auditor (CISA)	587	Offensive Security Certified Professional	121
Certified Information Security Manager	530	Valid Driver's License	97
GIAC Certifications	390	GIAC Certified Incident Handler	97
Certified Ethical Hacker	266	Cisco Certified Network Associate	90
Security Clearance	255	Master of Business Administration (MBA)	88
Certified In Risk and Information Systems Control	225	GIAC Security Essentials Certification (GSEC)	80
CompTIA Security+	205	Top Secret Clearance	76
Certified Cloud Security Professional (CCSP)	166	Cisco Certified Network Professional	74
NIST Cybersecurity Framework (CSF)	164		

Source: Lightcast

Table 11. Education Requirements for Information Security Occupations in Bay Region

Education Level	Job Postings	% of Total
High school or GED	184	4%
Associate degree	105	2%
Bachelor's degree & higher	4,254	94%

Source: Lightcast

Note: 37% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample.

Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCC Data Mart and CTE Launchboard.

Sources

O*Net Online

Lightcast

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

For more information, please contact:

- Leila Jamoosian, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (COE), leila@baccc.net
- John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 267-6544