LMI Analysis for Program Recommendation
Information Technology Occupations
Cabrillo 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 Information Technology 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 2,634 students in the Bay region and 299 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 Technology Occupations in the 12 county Bay region and in the SC-Monterey sub-region for a proposed Information Technology-Associate in Science 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%

- **Computer Network Support Specialists (15-1231):** Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption. Excludes "Network and Computer Systems Administrators" (15-1142) and "Computer Network Architects" (15-1143).
    Entry-Level Educational Requirement: Associate's degree
    Training Requirement: None
    Percentage of Community College Award Holders or Some Postsecondary Coursework: 41%

- **Network and Computer Systems Administrators (15-1244):** Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures. Excludes "Information Security Analysts"(15-1122), "Computer User Support Specialists" (15-1151), and "Computer Network Support Specialists" (15-1152).

  Entry-Level Educational Requirement: Bachelor's degree

  Training Requirement: None

  Percentage of Community College Award Holders or Some Postsecondary Coursework: 40%

Occupational Demand

Table 1. Employment Outlook for Information Technology Occupations in Bay Region

Occupation	2020 Jobs	2025 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Information Security Analysts	4,636	5,992	1,356	29%	3,680	736	$57	$93
Computer Network Support Specialists	5,615	6,507	891	16%	3,496	699	$33	$66
Network and Computer Systems Administrators	12,368	13,879	1,511	12%	6,352	1,270	$46	$80
Total	**22,619**	**26,378**	**3,759**	**17%**	**13,528**	**2,705**		

Source: EMSI 2021.3

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 Technology Occupations in SC-Monterey Sub-region

Occupation	2020 Jobs	2025 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Information Security Analysts	525	664	139	27%	396	79	$58	$94
Computer Network Support Specialists	616	704	88	14%	370	74	$37	$69
Network and Computer Systems Administrators	1,478	1,639	160	11%	732	146	$43	$77
Total	**2,619**	**3,007**	**388**	**15%**	**1,498**	**299**		

Source: EMSI 2021.3

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 (Dec 2020 - Nov 2021)

Occupation	Bay Region	SC-Monterey
Information Security Analysts	7,607	147
Network and Computer Systems Administrators	4,441	122

Computer Network Support Specialists	1,191	25

Source: Burning Glass

Table 4a. Top Job Titles for Information Technology Occupations for latest 12 months (Dec 2020 - Nov 2021) Bay Region

Title	Bay	Title	Bay
Systems Administrator	323	Linux Systems Administrator	56
Security Engineer	186	Security Architect	56
Senior Security Engineer	167	Network Administrator	55
Security Analyst	95	Service Delivery Manager	52
Information Security Analyst	89	Sleep Expert	51
IT Systems Administrator	89	Network Security Engineer	50
Information Security Engineer	85	Network Technician	48
Head of People	80	Cloud Security Engineer	47
Senior Systems Administrator	80	Customer Success Engineer	46

Source: Burning Glass

Table 4b. Top Job Titles for Information Technology Occupations for latest 12 months (Dec 2020 - Nov 2021) SC-Monterey Sub-Region

Title	SC-Monterey	Title	SC-Monterey
Systems Administrator	12	Senior Systems Administrator Unix In	4
It Specialist Information Security	5	Unix Systems Administrative	4
Lead Cyber Security Engineer - Cloud Container Security	5	Applications Administrator	3
Operator I	5	Aws/Ucpath Application Administrator	3
Bsoe Systems Administrator	4	Business Systems Information Systems Analyst	3
Cloud Security Analyst	4	Cyber Security Specialist II	3
Cyber Security Analyst	4	Cyber Security Specialist V	3
Lead Network Operations Analyst	4	Information Assurance Analyst	3
People Support Coordinator	4	Information Systems Security Engineer	3

Source: Burning Glass

Industry Concentration

Table 5. Industries hiring Information Technology Workers in Bay Region

Industry – 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2020)	Jobs in Industry (2025)	% Change (2020-25)	% Occupation Group in Industry (2020)
Custom Computer Programming Services	4,388	5,539	26%	20%
Computer Systems Design Services	2,423	2,878	19%	11%
Data Processing, Hosting, and Related Services	1,203	1,567	30%	5%
Internet Publishing and Broadcasting and Web Search Portals	1,155	1,473	28%	5%
Software Publishers	1,143	1,425	25%	5%
Electronic Computer Manufacturing	955	1,102	15%	4%
Corporate, Subsidiary, and Regional Managing Offices	950	912	-4%	4%
Other Computer Related Services	611	799	31%	3%
Local Government, Excluding Education and Hospitals	505	529	5%	2%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	458	515	12%	2%

Source: EMSI 2021.3

Table 6. Top Employers Posting Information Technology Occupations in Bay Region and SC-Monterey Sub-Region (Dec 2020 - Nov 2021)

Employer	Bay	Employer	SC-Monterey
Palo Alto Networks	268	The Home Depot Incorporated	24
Microsoft Corporation	253	University Of California	19
Wells Fargo	246	Epsilon	12
The Home Depot Incorporated	185	Deloitte	10
Cisco Systems Incorporated	178	Joby Aviation	7
Accenture	174	Mount Indie, Llc	6
Lucid Motors Inc	164	Iworks Corporation	6
Google Inc.	156	Change Healthcare	6
Splunk	151	Arctic Slope Regional Corporation	6
Allied Universal	116	Indrasoft Incorporated	5

Source: Burning Glass

Educational Supply

There are four (4) 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 SC-Monterey Sub-Region, there are no community colleges that issued 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
Gavilan	Silicon Valley	0	0	0
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 2,705 annual openings for the Information Technology occupational cluster and 71 annual (3-year average) awards for an annual undersupply of 2,634 students. In the SC-Monterey Sub-Region, there is also a gap with 299 annual openings and no annual (3-year average) awards for an annual undersupply of 299 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	73%	76%	68%	69%	64%	90%
Median Annual Earnings for SWP Exiting Students	$44,575	$39,206	$47,880	$55,878	$44,852	$53,045
Median Change in Earnings for SWP Exiting Students	30%	31%	17%	20%	27%	33%
Exiting Students Who Attained the Living Wage	53%	50%	61%	58%	56%	59%

Source: Launchboard Strong Workforce Program Median of 2016-18.

Skills, Certifications and Education

Table 9. Top Skills for Information Technology Occupations in Bay Region (Dec 2020 - Nov 2021)

Skill	Posting	Skill	Posting
Information Security	3,616	SQL	1,182
Linux	3,062	Cisco	1,125
Python	3,027	Microsoft Active Directory	1,116
System Administration	2,196	Domain Name System (DNS)	1,100
Project Management	1,723	UNIX	1,098
Customer Service	1,691	Software Engineering	1,090
Network Security	1,563	Kubernetes	1,072
Information Systems	1,519	Transmission Control Protocol / Internet Protocol (TCP / IP)	1,070
Java	1,460	DevOps	1,068
Software Development	1,376	Security Operations	1,041

Cryptography	1,352	Virtualization	999
Technical Support	1,276	Authentication	989
VMware	1,204	Good Clinical Practices (GCP)	970
Penetration Testing	1,202	Software as a Service (SaaS)	955

Source: Burning Glass

Table 10. Certifications for Information Technology Occupations in Bay Region (Dec 2020 - Nov 2021)

Certification	Posting	Certification	Posting
Certified Information Systems Security Professional (CISSP)	1,808	Certified in Risk and Information Systems Control	311
Certified Information Systems Auditor (CISA)	773	Cisco Certified Security Professional	235
SANS/GIAC Certification	751	Cisco Certified Network Professional (CCNP)	233
Certified Information Security Manager (CISM)	738	GIAC Certified Incident Handler (GCIH)	193
IT Infrastructure Library (ITIL) Certification	569	Microsoft Certified Solutions Expert (MCSE)	185
Security Clearance	419	Project Management Certification	171
Cisco Certified Network Associate (CCNA)	417	GIAC Security Essentials Certification	155
CompTIA Security+	412	CompTIA Network+	138
Information Systems Certification	409	Microsoft Certified Solutions Associate (MCSA)	119
Driver's License	373	Cisco Certified Internetwork Expert (CCIE)	114

Source: Burning Glass

Note: 69% of records have been excluded because they do not include a certification. As a result, the chart above may not be representative of the full sample.

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

Education (minimum advertised)	Latest 12 Mos. Postings	Percent 12 Mos. Postings
High school or vocational training	680	9%
Associate's degree	276	3%
Bachelor's degree and higher	6,969	88%

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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