



# Labor Market Information Report

## Computer Information Science Occupations

### Laney College

Prepared by the San Francisco Bay Center of Excellence for Labor Market Research  
December 2024

#### Recommendation

Based on all available data, there appears to be a large “undersupply” of Computer Information Science workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda, Contra Costa counties). There is a projected annual gap of about 20,955 students in the Bay region and 2,375 students in the East Bay Sub-Region.

#### Introduction

This report provides student outcomes data on employment and earnings for TOP 0707.10 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 Laney College and in the region.

This report profiles Computer Information Science Occupations in the 12 county Bay region and in the East Bay sub-region for a college/district program review at Laney College.

Computer and Information Research Scientists was selected by Laney College for inclusion in this report and so occupational data is included in Tables 1 and 2 as a reference. However, because this occupation typically requires a master's degree, and therefore is not an occupation community colleges can prepare students for in the labor market, the demand for this occupation is not included in the demand vs. supply calculation.

- **Computer Systems Analysts (15-1211):** 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%
- **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 and Information Research Scientists (15-1221):** Conduct research into fundamental computer and information science as theorists, designers, or inventors. Develop solutions to problems in the field of computer hardware and software.

Entry-Level Educational Requirement: Master's degree  
 Training Requirement: None  
 Percentage of Community College Award Holders or Some Postsecondary Coursework: 10%
- 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%
- Software Developers (15-1252):** Research, design, and develop computer and network software or specialized utility programs. Analyze user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. Update software or enhance existing software capabilities. May work with computer hardware engineers to integrate hardware and software systems, and develop specifications and performance requirements. May maintain databases within an application area, working individually or coordinating database development as part of a team.

Entry-Level Educational Requirement: Bachelor's degree  
 Training Requirement: None  
 Percentage of Community College Award Holders or Some Postsecondary Coursework: NA%

## Occupational Demand

**Table 1. Employment Outlook for Computer Information Science Occupations in Bay Region**

Occupation	2022 Jobs	2027 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Computer Systems Analysts	28,484	26,374	-2,110	-7%	10,639	2,128	\$46	\$61
Information Security Analysts	8,189	14,814	6,625	81%	11,018	2,204	\$59	\$67
Computer and Information Research Scientists	4,439	5,332	893	20%	2,624	525	\$75	\$90
Network and Computer Systems Administrators	12,622	12,634	12	0%	4,725	945	\$44	\$57
Software Developers	129,064	158,790	29,726	23%	81,385	16,277	\$61	\$78
<b>Total</b>	<b>182,798</b>	<b>217,945</b>	<b>35,147</b>	<b>19%</b>	<b>110,392</b>	<b>22,079</b>		

Source: EMSI 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 Computer Information Science Occupations in East Bay Sub-region**

Occupation	2022 Jobs	2027 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Computer Systems Analysts	5,317	4,782	-535	-10%	1,726	345	\$41	\$54
Information Security Analysts	1,534	1,968	434	28%	1,079	216	\$54	\$57
Computer and Information Research Scientists	795	797	2	0%	320	64	\$69	\$77
Network and Computer Systems Administrators	2,497	2,484	-13	-1%	817	163	\$39	\$52
Software Developers	17,540	19,190	1,650	9%	8,256	1,651	\$54	\$69
<b>Total</b>	<b>27,683</b>	<b>29,223</b>	<b>1,539</b>	<b>6%</b>	<b>12,198</b>	<b>2,439</b>		

Source: EMSI 2022.3

**East Bay Sub-Region includes:** Alameda, 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 (Oct. 2023 – Sept. 2024)**

Occupation	Bay Region	East Bay
Computer User Support Specialists	15,336	3,633
Network and Computer Systems Administrators	5,209	1,107
Computer Network Architects	4,521	853
Computer Occupations, All Other	1,672	321
Computer Network Support Specialists	1,211	247

Source: Burning Glass

**Table 4a. Top Job Titles for Computer Information Science Occupations for latest 12 months - (Oct. 2023 – Sept. 2024) - Bay Region**

Title	Bay	Title	Bay
Network Engineer	527	Help Desk Specialist - Home	204
It Support Specialist	447	Field Service Technician	199
Desktop Support Technician	446	Technical Support Specialist	198
Desktop Support	419	Desktop Support Specialist	194
Systems Administrator	371	Desktop Support Analyst	178
It Support Technician	276	Senior Systems Administrator	156
Senior Network Engineer	270	It Specialist	137

Technical Support Engineer	210	Help Desk Technician	122
It Technician	207	It Help Desk Technician	120

Source: Burning Glass

**Table 4b. Top Job Titles for Computer Information Science Occupations for latest 12 months - (Oct. 2023 – Sept. 2024) - East Bay Sub-Region**

Title	East Bay	Title	East Bay
Desktop Support	112	Senior Network Engineer	59
Network Engineer	101	Desktop Support Analyst	47
Desktop Support Technician	94	Senior Systems Administrator	47
Field Service Technician	91	Technical Support Specialist	45
It Support Specialist	89	It Specialist	37
Systems Administrator	85	Technical Support Engineer	37
It Technician	70	Desktop Support Specialist	34
Help Desk Specialist - Home	64	Computer Technician	33
It Support Technician	63	Desktop Technician	33

Source: Burning Glass

## Industry Concentration

**Table 5. Industries hiring Computer Information Science Workers in Bay Region**

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2022)	Jobs in Industry (2027)	% Change (2022-27)	% Occupation Group in Industry (2022)
Custom Computer Programming Services	38,190	45,362	19%	20%
Internet Publishing & Broadcasting and Web Search Portals	14,054	30,882	120%	13%
Computer Systems Design Services	21,490	23,756	11%	11%
Software Publishers	21,785	24,883	14%	11%
Electronic Computer Manufacturing	14,190	12,351	-13%	6%
Data Processing, Hosting, and Related Services	7,637	9,797	28%	4%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	4,398	6,160	40%	3%
Corporate, Subsidiary, and Regional Managing Offices	5,204	4,880	-6%	3%
Other Computer Related Services	5,167	5,793	12%	3%

Research and Development in Biotechnology (except Nanobiotechnology)	2,463	3,986	62%	2%
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Source: EMSI 2022.3

**Table 6. Top Employers Posting Computer Information Science Occupations in Bay Region and East Bay Sub-Region (Oct. 2023 – Sept. 2024)**

Employer	Bay	Employer	East Bay
Deloitte	587	Deloitte	118
Best Buy	190	University Of California	99
Google Inc.	174	Lawrence Livermore National Laboratory	86
Apple Inc.	160	Best Buy	59
Accenture	159	Kaiser Permanente	48
University Of California	146	Wells Fargo	43

Source: Burning Glass

### Educational Supply

There are 13 community colleges in the Bay Region issuing 588 awards on average annually (last 3 years ending 2022-23) on TOP 0707.10 Computer Programming. In the East Bay Sub-Region, there are five (5) community colleges that issued 293 awards on average annually (last 3 years) on this TOP code.

There are a two (2) other educational institutions in the Bay Region issuing 11 Bachelor's degree awards on average annually (last 3 years ending 2023-24) on CIP 11.0201 - Computer Programming/Programmer, General. There are no educational institution in the East Bay Sub-Region issuing Bachelor's degree awards on average annually (last 3 years) on this CIP code.

**Table 7a. Community College Awards on TOP 0707.10 - Computer Programming in Bay Region**

College	Subregion	Associate	Certificates	Total
Berkeley City	East Bay	1	2	3
Cabrillo	SC-Monterey	0	36	36
De Anza	Silicon Valley	9	77	86
Diablo Valley	East Bay	124	138	262
Gavilan	Silicon Valley	17	2	19
Hartnell	SC-Monterey	41	2	43
Laney	East Bay	17	6	23
Las Positas	East Bay	1	0	1
Ohlone	East Bay	1	3	4
San Francisco	Mid-Peninsula	0	66	66
San Jose City	Silicon Valley	10	14	24

College	Subregion	Associate	Certificates	Total
San Mateo	Mid-Peninsula	2	9	11
Solano	North Bay	9	1	10
<b>Total</b>		<b>232</b>	<b>356</b>	<b>588</b>

Source: Data Mart

Note: The annual average for awards is 2020-21 – 2022-23.

**Table 7b. Bachelor's Degree Awards on CIP 11.0201 - Computer Programming/Programmer, General in Bay Region**

College	Subregion	Bachelor's degree	Total
Cogswell University of Silicon Valley	Silicon Valley	9	9
Dominican University of California	North Bay	2	2
<b>Total</b>		<b>11</b>	<b>11</b>

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

## Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 22,079 annual openings for the Computer Information Science occupational cluster and 599 annual (3-year average) awards for an annual undersupply of 20,955 students. In the East Bay Sub-Region, there is also a large gap with 2,375 annual openings and no annual (3-year average) awards for an annual undersupply of 2,375 students.

## Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0707.10 - Computer Programming**

Metric Outcomes	Bay All CTE Programs	Laney All CTE Programs	State 0707.10	Bay 0707.10	East Bay 0707.10	Laney 0707.10
Students with a Job Closely Related to Their Field of Study	74%	73%	65%	66%	65%	60%
Median Annual Earnings for SWP Exiting Students	\$47,419	\$40,660	\$39,896	\$55,772	\$45,108	\$33,756
Median Change in Earnings for SWP Exiting Students	23%	14%	21%	20%	22%	-30%
Exiting Students Who Attained the Living Wage	52%	52%	54%	55%	55%	44%

Source: Launchboard Strong Workforce Program Median of 2019 to 2022.

## Skills, Certifications and Education

**Table 9. Top Skills for Computer Information Science Occupations in Bay Region (Oct. 2023 – Sept. 2024)**

Skill	Posting	Skill	Posting
Technical Support	9,266	Virtual Private Networking (VPN)	2,515
Customer Service	6,927	Customer Contact	2,493
Repair	4,104	Hardware Troubleshooting	2,466
Linux	4,051	Domain Name System (DNS)	2,458
Microsoft Active Directory	3,908	Macintosh OS	2,386
It Support	3,564	Network Engineering	2,341
Help Desk Support	3,409	Software Installation	2,338
System Administration	3,203	Network Troubleshooting	2,321
Hardware and Software Installation	3,185	Transmission Control Protocol/Internet Protocol (TCP/IP)	2,242
Printers	3,117	Hardware and Software Configuration	2,241
Python	3,069	Vaccination	2,186
Cisco	2,989	Troubleshooting Technical Issues	2,076
Project Management	2,851	Scheduling	2,063
Microsoft Operating Systems	2,666	Wide Area Network (WAN)	2,048

Source: Burning Glass

**Table 10. Certifications for Computer Information Science Occupations in Bay Region (Oct. 2023 – Sept. 2024)**

Certification	Posting	Certification	Posting
Driver's License	1,599	Microsoft Certified Solutions Expert (MCSE)	344
IT Infrastructure Library (ITIL) Certification	1,394	Certified Information Systems Security Professional (CISSP)	326
Certified A+ Technician	1,234	Microsoft Certified Solutions Associate (MCSA)	320
Cisco Certified Network Associate (CCNA)	956	Project Management Certification	242
Cisco Certified Network Professional (CCNP)	733	Certified Information Systems Auditor (CISA)	149
CompTIA Network+	638	Project Management Professional (PMP)	116
Microsoft Certified Professional (MCP)	476	Certified Information Security Manager (CISM)	94
Cisco Certified Internetwork Expert (CCIE)	437	Microsoft Certified Technology Specialist (MCTS)	90
Security Clearance	426	Apple Certified Macintosh Technician	88

CompTIA Security+	388	Cisco Certified Design Professional (CCDP)	83
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Source: Burning Glass

Note: 75% 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 Computer Information Science Occupations in Bay Region**

Education (minimum advertised)	Latest 12 Mos. Postings	Percent 12 Mos. Postings
High school or vocational training	3,004	19%
Associate's degree	1,582	10%
Bachelor's degree and higher	11,139	71%

Source: Burning Glass

Note: 44% 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 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/](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

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