

# Cybersecurity Occupations

# Labor Market Information Report

# Gavilan College

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

**March 2021**

## 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 3,447 students in the Bay region and 1,359 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 Gavilan 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 Gavilan College.

* **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%

## 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 Systems Analysts | 30,581 | 34,096 | 3,515 | 11% | 14,997 | 2,999 | $ 44.24 | $ 57.02 |
| Information Security Analysts | 3,714 | 4,835 | 1,121 | 30% | 2,595 | 519 | $ 44.51 | $ 59.46 |
| **Total** | **34,295** | **38,931** | **4,636** | **14%** | **17,592** | **3,518** | **$44.27** | **$57.28** |
| 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 Systems Analysts | 12,180 | 13,511 | 1,331 | 11% | 5,888 | 1,178 | $ 44.44 | $ 56.89 |
| Information Security Analysts | 1,284 | 1,680 |  396 | 31% | 906 | 181 | $ 46.94 | $ 63.77 |
| **Total** | **13,464** | **15,191** | **1,727** | **13%** | **6,794** | **1,359** | **$44.68** | **$57.55** |
| Source: EMSI 2020.4 |

**Silicon Valley Sub-Region includes:** Santa Clara Counties

### Job Postings in Bay Region and Silicon Valley Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Apr 2020 - Mar 2021)**

| **Occupation** | **Bay Region** | **Silicon Valley** |
| --- | --- | --- |
| Computer Systems Analysts | 11,874 | 98 |
| Information Security Analysts | 7,577 | 110 |
| Source: Burning Glass |

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

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Business Systems Analyst | 772 | Fullstack Developer | 100 |
| Security Engineer | 277 | It Business Analyst | 96 |
| Senior Business Systems Analyst | 181 | React Developer | 94 |
| Senior Security Engineer | 135 | Reactjs Developer | 91 |
| React Js Developer | 135 | Golang Developer | 87 |
| Systems Analyst | 133 | Mulesoft Developer | 80 |
| Information Security Engineer | 115 | Information Security Analyst | 80 |
| Security Analyst | 114 | Network Security Engineer | 76 |
| Aem Developer | 106 | Cloud Security Engineer | 75 |
| Source: Burning Glass |

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

| **Title** | **Silicon Valley** | **Title** | **Silicon Valley** |
| --- | --- | --- | --- |
| Application Security Analyst | 9 | Edi Analyst III | 3 |
| Security Analyst | 4 | Cloud Security Analyst | 3 |
| Openbmc Developer | 4 | Technology Analyst | 2 |
| IT Specialist Information Security | 4 | Technical Consultant, Looker, Google Cloud | 2 |
| Cyber Security Analyst | 4 | Team Lead In | 2 |
| Business Systems Analyst | 4 | Task Supervisor/Applications Systems Analyst Lead, Secret Government Clearance | 2 |
| Security Analyst Associate | 3 | Systems Analyst I Exempt-Hit | 2 |
| Qc Technical Analyst | 3 | Systems Analyst I | 2 |
| Lead Staff | 3 | Systems Analyst - Hit | 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 | 8,672 | 10,594 | 22% | 25% |
| Computer Systems Design Services | 5,012 | 5,784 | 15% | 14% |
| Corporate, Subsidiary, and Regional Managing Offices | 1,760 | 1,657 | -6% | 5% |
| Internet Publishing and Broadcasting and Web Search Portals | 1,610 | 1,961 | 22% | 5% |
| Data Processing, Hosting, and Related Services | 1,480 | 1,975 | 33% | 4% |
| Software Publishers | 1,449 | 1,893 | 31% | 4% |
| Electronic Computer Manufacturing | 1,264 | 1,422 | 13% | 4% |
| Other Computer Related Services | 1,229 | 1,612 | 31% | 4% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) | 721 | 823 | 14% | 2% |
| Local Government, Excluding Education and Hospitals | 603 | 613 | 2% | 2% |
| Source: EMSI 2020.4 |

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

| **Employer** | **Bay** | **Employer** | **Silicon Valley** |
| --- | --- | --- | --- |
| Wells Fargo | 278 | Indrasoft Incorporated | 14 |
| Palo Alto Networks | 186 | University Of California | 10 |
| Cisco Systems Incorporated | 186 | Northrop Grumman | 6 |
| Accenture | 179 | Joby Aviation | 6 |
| Facebook | 171 | Devine Consulting Incorporated | 6 |
| Google Inc. | 149 | Crowdstrike | 6 |
| IBM | 142 | Montage Health | 5 |
| Splunk | 139 | Lintech Global, Inc | 5 |
| Pacific Gas and Electric Company | 128 | United States Fleet Forces Command | 4 |
| Amazon | 127 | US Department of Defense | 4 |
| 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 Silicon Valley Sub-Region, there are no community colleges that issued awards on average annually (last 3 years) on this TOP code.

**Table 7a. 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 3,518 annual openings for the Cybersecurity occupational cluster and 71 annual (3-year average) awards for an annual undersupply of 3,447 students. In the Silicon Valley Sub-Region, there is also a gap with 1,359 annual openings and no annual (3-year average) awards for an annual undersupply of 1,359 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** | **Gavilan****All CTE Programs** | **State 0708.00** | **Bay 0708.00** | **Silicon Valley 0708.00** | **Gavilan College 0708.00** |
| --- | --- | --- | --- | --- | --- | --- |
| Students with a Job Closely Related to Their Field of Study | 75% | 79% | 69% | 73% | 77% | N/A |
| Median Annual Earnings for SWP Exiting Students | $44,575 | $54,252 | $45,276 | $52,482 | $61,094 | $44,407 |
| Median Change in Earnings for SWP Exiting Students | 31% | 27% | 21% | 26% | 19% | N/A |
| Exiting Students Who Attained the Living Wage | 52% | 67% | 64% | 57% | 64% | 73% |
| Source: Launchboard Strong Workforce Program from version 2017-18. |

## Skills, Certifications and Education

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

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| Information Security | 3,622 | JavaScript | 1,690 |
| Python | 3,188 | Customer Service | 1,607 |
| Business Process | 3,066 | SAP | 1,521 |
| Project Management | 2,954 | Software Engineering | 1,500 |
| SQL | 2,844 | Software as a Service (SaaS) | 1,335 |
| Java | 2,705 | Network Security | 1,306 |
| Software Development | 2,640 | Salesforce | 1,281 |
| Business Systems Analysis | 2,637 | Cryptography | 1,233 |
| Business Systems | 2,614 | DevOps | 1,153 |
| Oracle | 2,192 | Data Analysis | 1,111 |
| Information Systems | 2,189 | Quality Assurance and Control | 1,109 |
| Linux | 2,056 | Systems Development Life Cycle (SDLC) | 1,053 |
| Business Analysis | 2,031 | Enterprise Resource Planning (ERP) | 1,028 |
| Systems Analysis | 1,829 | Scrum | 1,009 |
| Source: Burning Glass |

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

| **Certification** | **Posting** | **Certification** | **Posting** |
| --- | --- | --- | --- |
| Certified Information Systems Security Professional (CISSP) | 1,849 | Driver's License | 244 |
| Certified Information Systems Auditor (CISA) | 924 | Cisco Certified Network Associate (CCNA) | 237 |
| Certified Information Security Manager (CISM) | 810 | Cisco Certified Security Professional | 216 |
| SANS/GIAC Certification | 734 | GIAC Certified Incident Handler (GCIH) | 180 |
| Information Systems Certification | 541 | GIAC Security Essentials Certification | 166 |
| IT Infrastructure Library (ITIL) Certification | 396 | Project Management Professional (PMP) | 158 |
| Certified in Risk and Information Systems Control | 351 | Cisco Certified Network Professional (CCNP) | 131 |
| Security Clearance | 344 | GIAC Certified Intrusion Analyst | 123 |
| CompTIA Security+ | 298 | Certified Ethical Hacker (CEH) | 99 |
| Project Management Certification | 296 | Systems Security Certified Practitioner (SSCP) | 83 |
| Source: Burning Glass |

*Note: 80% 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 | 660 | 6% |
| Associate's degree | 158 | 2% |
| Bachelor's degree and higher | 9,449 | 92% |
| Source: Burning Glass |

*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.*

## 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

For more information, please contact:

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