

# IT Essentials Occupations

# Labor Market Information Report

# Foothill College

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

**June 2021**

## Recommendation

Based on all available data, there appears to be an “undersupply” of IT Essentials 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 1,554 students in the Bay region and 683 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 IT Essentials Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Foothill College.

* **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%
* **Computer Network Architects (15-1241):** Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning. May also design network and computer security measures. May research and recommend network and data communications hardware and software. Excludes “Information Security Analysts” (15-1122), “Network and Computer Systems Administrators” (15-1142), 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: 37%
* **Computer, Automated Teller, and Office Machine Repairers (49-2011):** Repair, maintain, or install computers, word processing systems, automated teller machines, and electronic office machines, such as duplicating and fax machines.
  Entry-Level Educational Requirement: Some college, no degree
  Training Requirement: Short-term on-the-job training
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 52%

## Occupational Demand

**Table 1. Employment Outlook for IT Essentials 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 Network Support Specialists | 5,928 | 6,412 | 484 | 8% | 3,349 | 558 | $29 | $39 |
| Computer Network Architects | 8,339 | 9,866 | 1,526 | 18% | 4,768 | 795 | $58 | $75 |
| Computer, Automated Teller, and Office Machine Repairers | 3,493 | 2,976 | -516 | -15% | 1,864 | 311 | $16 | $20 |
| **Total** | **17,760** | **19,254** | **1,494** | **8%** | **9,981** | **1,664** | **$40.06** | **$52.17** |
| Source: EMSI 2021.2 |

**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 IT Essentials 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 Network Support Specialists | 2,244 | 2,507 | 263 | 12% | 1,298 | 216 | $27 | $38 |
| Computer Network Architects | 3,749 | 4,588 | 839 | 22% | 2,331 | 388 | $62 | $79 |
| Computer, Automated Teller, and Office Machine Repairers | 913 | 771 | -141 | -16% | 474 | 79 | $16 | $21 |
| **Total** | **6,906** | **7,866** | **960** | **14%** | **4,103** | **683** | **$44.55** | **$58.01** |
| Source: EMSI 2021.2 |

**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 (May 2020 - Apr 2021)**

| **Occupation** | **Bay Region** | **Silicon Valley** |
| --- | --- | --- |
| Computer Network Architects | 3,798 | 1,901 |
| Computer Network Support Specialists | 976 | 454 |
| Computer, Automated Teller, and Office Machine Repairers | 142 | 50 |
| Source: Burning Glass |

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

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Network Engineer | 413 | Communications Designer | 27 |
| Senior Network Engineer | 208 | Network Engineer III | 26 |
| Network Architect | 73 | Atm Technician | 23 |
| Customer Success Engineer | 62 | Senior Cloud Architect | 22 |
| Network Technician | 53 | Network Engineer IV | 22 |
| Senior Architect | 52 | Network Operations Analyst | 21 |
| Automation Engineer | 40 | Network Architect III | 21 |
| .Net Architect | 34 | Chief Architect | 21 |
| Reliability Engineer | 29 | Data Visualization Engineer | 19 |
| Source: Burning Glass |

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

| **Title** | **Silicon Valley** | **Title** | **Silicon Valley** |
| --- | --- | --- | --- |
| Network Engineer | 214 | Senior Cloud Architect | 14 |
| Senior Network Engineer | 103 | Systems Support Specialist | 13 |
| Customer Success Engineer | 30 | Network Operations Engineer | 13 |
| Network Architect | 29 | .Net Architect | 13 |
| Senior Architect | 21 | Wireless Systems Engineer | 12 |
| Network Architect III | 19 | Lead Automation Engineer | 12 |
| Network Engineer III | 16 | Junior Network Engineer | 12 |
| Network Technician | 15 | Reliability Engineer | 11 |
| Network Engineer IV | 15 | Data Visualization Engineer | 11 |
| Source: Burning Glass |

## Industry Concentration

**Table 5. Industries hiring IT Essentials 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 | 3,498 | 4,366 | 25% | 21% |
| Computer Systems Design Services | 2,033 | 2,365 | 16% | 12% |
| Electronic Computer Manufacturing | 721 | 1,009 | 40% | 5% |
| Data Processing, Hosting, and Related Services | 889 | 1,089 | 22% | 5% |
| Internet Publishing and Broadcasting and Web Search Portals | 853 | 943 | 11% | 5% |
| Software Publishers | 699 | 949 | 36% | 4% |
| Corporate, Subsidiary, and Regional Managing Offices | 619 | 573 | -7% | 3% |
| Electronics Stores | 615 | 452 | -26% | 3% |
| Other Computer Related Services | 492 | 633 | 29% | 3% |
| Computer and Computer Peripheral Equipment and Software Merchant Wholesalers | 544 | 382 | -30% | 3% |
| Source: EMSI 2021.2 |

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

| **Employer** | **Bay** | **Employer** | **Silicon Valley** |
| --- | --- | --- | --- |
| Microsoft Corporation | 177 | Microsoft Corporation | 118 |
| Nvidia Corporation | 80 | Nvidia Corporation | 80 |
| IBM | 59 | IBM | 59 |
| Facebook | 50 | Apple Inc. | 49 |
| Apple Inc. | 50 | Vmware Incorporated | 38 |
| Vmware Incorporated | 49 | Palo Alto Networks | 38 |
| Cynet Systems | 46 | Cynet Systems | 30 |
| Amazon | 44 | Cisco Systems Incorporated | 26 |
| Cisco Systems Incorporated | 40 | Google Inc. | 24 |
| Palo Alto Networks | 39 | Applied Materials | 19 |
| 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 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.*

There are six (6) community colleges in the Bay Region issuing 39 awards on average annually (last 3 years ending 2018-19) on TOP 0701.00 - Information Technology, General. 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 7b. Community College Awards on TOP 0701.00 - Information Technology, General in Bay Region**

| **College** | **Subregion** | **Associate** | **Certificate Low** | **Total** |
| --- | --- | --- | --- | --- |
| Diablo Valley | East Bay | 1 | 1 | 2 |
| Los Medanos | East Bay | 0 | 8 | 8 |
| Monterey | SC-Monterey | 4 | 0 | 4 |
| Ohlone | East Bay | 1 | 2 | 3 |
| San Francisco | Mid-Peninsula | 0 | 12 | 12 |
| Santa Rosa | North Bay | 0 | 10 | 10 |
| **Total** |  | **6** | **33** | **39** |
| 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 1,664 annual openings for the IT Essentials occupational cluster and 110 annual (3-year average) awards on both TOP code 0708.00 and TOP code 0701.00 for an annual undersupply of 1,554 students. In the Silicon Valley Sub-Region, there is also a gap with 683 annual openings and no annual (3-year average) awards on these two TOP codes, for an annual undersupply of 683 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 | $44,575 | $63,206 | $45,276 | $52,482 | $61,094 | $76,522 |
| 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 IT Essentials Occupations in Bay Region (May 2020 - Apr 2021)**

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| Network Engineering | 1,487 | Transmission Control Protocol / Internet Protocol (TCP / IP) | 520 |
| Python | 1,287 | Technical Support | 516 |
| Cisco | 1,145 | Virtual Private Networking (VPN) | 510 |
| Linux | 791 | Domain Name System (DNS) | 485 |
| Border Gateway Protocol | 769 | Java | 480 |
| Wide Area Network (WAN) | 697 | DevOps | 470 |
| Routers | 678 | Software Development | 460 |
| Customer Service | 640 | SQL | 455 |
| Network Troubleshooting | 622 | Network Security | 417 |
| Project Management | 578 | Kubernetes | 390 |
| OSPF | 555 | Cisco Switching | 383 |
| Open Shortest Path First (OSPF) | 555 | Virtualization | 381 |
| Network Infrastructure (Edge POE Devices) | 537 | Juniper Networks | 367 |
| System/Network Configuration | 526 | Ansible | 362 |
| Source: Burning Glass |

**Table 10. Certifications for IT Essentials Occupations in Bay Region (May 2020 - Apr 2021)**

| **Certification** | **Posting** | **Certification** | **Posting** |
| --- | --- | --- | --- |
| Cisco Certified Network Professional (CCNP) | 467 | Microsoft Certified Solutions Associate (MCSA) | 36 |
| Cisco Certified Network Associate (CCNA) | 298 | Juniper Networks Certified Internet Expert | 36 |
| Cisco Certified Internetwork Expert (CCIE) | 290 | Cisco Certified Design Professional (CCDP) | 36 |
| IT Infrastructure Library (ITIL) Certification | 184 | AWS Certified Solutions Architect (AWS-CSA) | 34 |
| Driver's License | 125 | Vmware Certified Professional (VCP) | 31 |
| Certified Information Systems Security Professional (CISSP) | 91 | Certified A+ Technician | 30 |
| Security Clearance | 87 | Juniper Networks Certified Internet Professional | 26 |
| CompTIA Security+ | 52 | Juniper Networks Certified Internet Associate | 23 |
| Project Management Certification | 51 | Licensed Professional Engineer | 21 |
| CompTIA Network+ | 48 | Certified Salesforce Platform Developer | 19 |
| Source: Burning Glass |

*Note: 75% 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 IT Essentials Occupations in Bay Region**

| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| --- | --- | --- |
| High school or vocational training | 185 | 7% |
| Associate's degree | 136 | 5% |
| Bachelor's degree and higher | 2,393 | 88% |
| Source: Burning Glass |

*Note: 45% 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

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