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**Computer Science Program Report**

**For Greater South Bay and Peninsula Region**

**(Santa Clara and San Mateo Counties)**

**October 2014**

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| **Computer Science** |

CIP 2010: A program that focuses on computer theory, computing problems and solutions, and the design of computer systems and user interfaces from a scientific perspective. Includes instruction in the principles of computational science, computer development and programming, and applications to a variety of end-use situations.

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| **Target Occupations**‡ |
| Computer and Information Systems Managers (11-3021) |
| Computer and Information Research Scientists (15-1111) |
| Information Security Analysts (15-1122) |
| Computer Programmers (15-1131) |
| Software Developers, Applications (15-1132) |
| Software Developers, Systems Software (15-1133) |
| Web Developers (15-1134) |
| Computer Network Architects (15-1143) |
| Computer User Support Specialists (15-1151) |
| Computer Network Support Specialists (15-1152) |
| Computer Occupations, All Other (15-1199) |

 ‡Based on EMSI crosswalk of the Classification of Instructional Programs (CIP) codes with Standard Occupational Classification (SOC) codes as published by the U.S. Department of Education.

In 2014, the number of computer science jobs in the target occupations in Santa Clara and San Mateo Counties totaled 118,517. The Bureau of Labor Statistics (BLS) expects the total number of positions to increase by 7.4% over the next three years. Regional openings in 2014, which included created jobs and turnover, totaled 5,045. Completions in computer science programs totaled 471 from six institutions, with an additional 968 completions from other related programs. These other programs are linked to multiple occupations and not all those who complete will enter the target occupations indicated in this report.

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| **Target Occupation Performance** |
| **118,517\*** | **7.4%\*** | **$57.46/hr** |
| **Jobs (2014)** | **Growth (2014-2017)** | **Median Earnings** |
| National Location Quotient: 3.87† | National: 6.3% | National: $39.26/hr |

 \*Based on total number of jobs for target occupations Santa Clara and San Mateo Counties.

†Represents occupation density as compared to national average (national average=1).

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| Regional Openings (2014)\*\* | 5,045 |  |
| Regional Program Completions (2013) | 471 |  |
| All Regional Completions for Target Occupations†† (2013) | 1,439 |  |

 \*\*Openings include created jobs and turnover.

††Includes all regional programs applicable to target occupations.

**Computer Science Occupations Performance**

| **Target Occupations** | **Regional Openings (2014)** | **Median Hourly Earnings** | **Growth (2014-2017)** |
| --- | --- | --- | --- |
| Software Developers, Applications (15-1132) | 1,744 | $60.38 | 9.3% |
| Computer Network Architects (15-1143) | 131 | $65.79 | 5.6% |
| Computer and Information Systems Managers (11-3021) | 504 | $82.73 | 6.3% |
| Computer and Information Research Scientists (15-1111) | 97 | $58.20 | 5.7% |
| Information Security Analysts (15-1122) | 101 | $53.24 | 14.3% |
| Software Developers, Systems Software (15-1133) | 843 | $62.47 | 4.9% |
| Computer User Support Specialists (15-1151) | 629 | $32.34 | 10.3% |
| Computer Occupations, All Other (15-1199) | 157 | $45.95 | 5.9% |
| Web Developers (15-1134) | 252 | $42.57 | 13.4% |
| Computer Network Support Specialists (15-1152) | 127 | $43.18 | 3.9% |
| Computer Programmers (15-1131) | 459 | $41.91 | 5.2% |

**Regional Breakdown for Computer Science Occupations**

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| --- | --- | --- | --- | --- | --- |
| **County Name** | **2014 Jobs** | **2017 Jobs** | **2014 Annual Openings** | **Median Hourly Earnings** | **2014 National Location Quotient** |
| Santa Clara | 95,254 | 102,060 | 3,935 | $57.61 | 4.28 |
| San Mateo | 23,263 | 25,226 | 1,110 | $56.88 | 2.78 |
| Total | 118,517 | 127,286 | 5,045 | $57.46 |  |

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| **Regional Computer Science Training Providers** |
| **6** | **471\*** |
| **Institutions** | **Completions (2013)** |

 \*Based on IPEDS data.



| **Institution** | **Degrees** | **Certificates** | **Total Completions** |
| --- | --- | --- | --- |
| Stanford University | 325 | 0 | 325 |
| San Jose State University | 130 | 0 | 130 |
| Mission College | 7 | 0 | 7 |
| Foothill College | 6 | 0 | 6 |
| College of San Mateo | 2 | 0 | 2 |

Other regional programs may train individuals eligible for the targeted computer science occupations, which are based on an occupation-program crosswalk developed by the Department of Education. These additional programs are offered at 17 regional colleges\*. As noted earlier, many postsecondary programs are linked to multiple occupations and not all those who complete the program will enter the target occupation.

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| **Related Regional Programs Allowing Entry to Computer Science** |
| **22** | **1,439** |
| **Programs (2013)** | **Completions (2013)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Program** | **2009** | **2010** | **2011** | **2012** | **2013** |
| Computer Science (11.0701) | 382 | 404 | 569 | 764 | 471 |
| Computer Software Engineering (14.0903) | 440 | 195 | 245 | 239 | 366 |
| Computer Engineering, General (14.0901) | 194 | 213 | 203 | 270 | 291 |
| Computer Systems Networking and Telecommunications (11.0901) | 35 | 47 | 23 | 78 | 82 |
| Computer Programming/Programmer, General (11.0201) | 21 | 41 | 43 | 60 | 65 |
| Web Page, Digital/Multimedia and Information Resources Design (11.0801) | 14 | 14 | 12 | 49 | 42 |
| Information Resources Management (52.1206) | 17 | 13 | 37 | 22 | 31 |
| Computer Graphics (11.0803) | 1 | 25 | 21 | 33 | 29 |
| Medical Informatics (51.2706) | 13 | 6 | 19 | 28 | 12 |
| Computer and Information Systems Security/Information Assurance (11.1003) | 52 | 37 | 55 | 8 | 9 |
| Management Information Systems, General (52.1201) | 30 | 14 | 8 | 9 | 9 |
| Mathematics and Computer Science (30.0801) | 4 | 10 | 6 | 2 | 9 |
| Web/Multimedia Management and Webmaster (11.1004) | 4 | 3 | 3 | 3 | 7 |
| Computer and Information Sciences, General (11.0101) | 40 | 36 | 13 | 4 | 6 |
| Computer Support Specialist (11.1006) | 0 | 0 | 1 | 3 | 5 |
| Information Technology (11.0103) | 4 | 1 | 4 | 6 | 4 |
| Computer Systems Analysis/Analyst (11.0501) | 0 | 0 | 0 | 0 | 1 |
| Management Information Systems and Services, Other (52.1299) | 0 | 0 | 0 | 0 | 0 |
| System, Networking, and LAN/WAN Management/Manager (11.1002) | 0 | 0 | 0 | 0 | 0 |
| Data Processing and Data Processing Technology/Technician (11.0301) | 0 | 0 | 0 | 0 | 0 |
| Network and System Administration/Administrator (11.1001) | 1 | 0 | 0 | 0 | 0 |
| Operations Management and Supervision (52.0205) | 0 | 0 | 1 | 0 | 0 |

\*Additional colleges: Canada College, De Anza College, Foothill College, Gavilan College, Mission College, The National Hispanic University, Notre dame de Namur University, San Jose City College, San Jose State University, College of San Mateo, Santa Clara University, Skyline College, West Valley College, Stanford University, University of Phoenix- Bay Area Campus, Carrington College- San Jose, International Technological University, The Art Institute of California- Argosy University- Silicon Valley

**Target Occupation Demographics**

The demographics among those employed in computer science occupations in Santa Clara and San Mateo Counties for 2014 show that a majority are men (77%) and between the ages of 25-44 (65%).

**Gender Demographics (Regional)**

|  |  |  |
| --- | --- | --- |
| Gender |   |   |
| Male | 77% |  |
| Female | 23% |  |

**Age Demographics (Regional)**

|  |  |  |
| --- | --- | --- |
| Age |   |   |
| 14-18 | 0% |  |
| 19-24 | 4% |  |
| 25-44 | 65% |  |
| 45-64 | 30% |  |
| 65+ | 1% |  |

**Industries Employing Computer Science Occupations**

A number of industries in Santa Clara and San Mateo Counties employ those trained in computer science and its related occupations. The following table represents a regional industry breakdown of the number of computer science positions employed, the percentage of computer science jobs employed by industry and the percentage computer science jobs represent within all jobs by each industry. While custom computer programming services employed 21.3% of all regional computer science positions in 2014, computer science and its related occupations represent just over half of the total jobs in that industry (50.4%).

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| **Inverse Staffing Patterns (Regional)** |
| **Industry** | **Occupation Group Jobs in Industry (2014)** | **% of Occupation Group in Industry (2014)** | **% of Total Jobs in Industry (2014)** |
| Custom Computer Programming Services (541511) | 25,217 | 21.3% | 50.4% |
| Electronic Computer Manufacturing (334111) | 14,694 | 12.4% | 34.0% |
| Computer Systems Design Services (541512) | 13,860 | 11.7% | 50.9% |
| Software Publishers (511210) | 13,467 | 11.4% | 51.5% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 12,611 | 10.6% | 33.1% |

**Compatible Occupations for Computer Science**

Individuals completing a computer science program share many skills and abilities with other occupations. The Occupational Information Network (O\*Net) identifies compatible occupations based on an analysis of overlapping knowledge, skills and ability. Additional education required for transition can range from short on-site training to advanced post-secondary degrees. The following table shows how much education might be needed to be employed in these compatible occupations.

**Top Ten Compatible Occupations for Computer Science: Associate’s Degree or Less**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rank | Occupation | Median Hourly Earnings | 2014 Jobs | 2014-2017 Change | 2014-2017 Estimated Annual Openings |
| 1 | Computer Operators | $21.88 | 612 | 17 | 10 |
| 2 | Web Developers | $42.57 | 3,717 | 499 | 173 |
| 3 | Audio and Video Equipment Technicians | $21.33 | 876 | 70 | 30 |
| 4 | Computer, Automated Teller, and Office Machine Repairers | $19.53 | 2,394 | 14 | 46 |
| 5 | Electrical Engineering Technicians | $29.71 | 4,821 |  (8) | 82 |
| 6 | Broadcast Technicians | $19.76 | 187 |  (6) | 3 |
| 7 | Neurodiagnostic Technologists | $26.34 | 1,441 | 162 | 52 |
| 8 | Power Distributors and Dispatchers | $51.08 | 36 | 1 | 1 |
| 9 | Mechanical Drafters | $30.36 | 631 | (24) | 7 |
| 10 | Electronic Drafters | $33.20 | 541 | 0 | 6 |

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| **Data Sources and Calculations** |

**State Data Sources**

This report uses state data from the following agencies: California Labor Market Information Department

**Institution Data**

The institution data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

**Completers Data**

The completers data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

**Occupation Data**

EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry.

**Staffing Patterns Data**

The staffing pattern data in this report are compiled from several sources using a specialized process. For QCEW and Non-QCEW Employees classes of worker, sources include Occupational Employment Statistics, the National Industry-Occupation Employment Matrix, and the American Community Survey. For the Self-Employed and Extended Proprietors classes of worker, the primary source is the American Community Survey, with a small amount of information from Occupational Employment Statistics.

**Industry Data**

EMSI industry data have various sources depending on the class of worker. (1) For QCEW Employees, EMSI primarily uses the QCEW (Quarterly Census of Employment and Wages), with supplemental estimates from County Business Patterns and Current Employment Statistics. (2) Non-QCEW employees data are based on a number of sources including QCEW, Current Employment Statistics, County Business Patterns, BEA State and Local Personal Income reports, the National Industry-Occupation Employment Matrix (NIOEM), the American Community Survey, and Railroad Retirement Board statistics. (3) Self-Employed and Extended Proprietor classes of worker data are primarily based on the American Community Survey, Nonemployer Statistics, and BEA State and Local Personal Income Reports. Projections for QCEW and Non-QCEW Employees are informed by NIOEM and long-term industry projections published by individual states.