** Game Design Occupations**

**Labor Market Information Report**

**Foothill College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

December 2019

# Recommendation

Based on all available data, there appears to be a significant undersupply of Game Design 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 4,576 students in the Bay region and 1,645 students in the Silicon Valley Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0614.20 - Electronic Game Design 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.

# Introduction

This report profiles Game Design Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Foothill College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Video Game Designers (15-1199.11), therefore, the data shown in Tables 1 and 2 is for Computer Occupations, All Other (at the six digit SOC level) and likely overstates demand for Video Game Designers. Tables 3, 4, 6, 9, and 10 use job postings data from Burning Glass at the eight-digit SOC Code level for Video Game Designers (15-1199.11).

|  |
| --- |
| * **Multimedia Artists and Animators (SOC 27-1014):** Create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials. |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 27% |
|  |
| * **Web Developers (SOC 15-1134)**: Design, create, and modify Web sites. Analyze user needs to implement Web site content, graphics, performance, and capacity. May integrate Web sites with other computer applications. May convert written, graphic, audio, and video components to compatible Web formats by using software designed to facilitate the creation of Web and multimedia content. Excludes “Multimedia Artists and Animators” (27-1014). |
| Entry-Level Educational Requirement: Associate's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 25*%* |
|  |
| * **Computer Occupations, All Other (SOC 15-1199):** All computer occupations not listed separately. Excludes “Computer and Information Systems Managers” (11-3021), “Computer Hardware Engineers” (17-2061), “Electrical and Electronics Engineers” (17-2070), “Computer Science Teachers, Postsecondary” (25-1021), “Multimedia Artists and Animators” (27-1014), “Graphic Designers” (27-1024), “Computer Operators” (43-9011), and “Computer, Automated Teller, and Office Machine Repairs” (49-2011). |
| Entry-Level Educational Requirement: Bachelor's *degree* |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 35*%* |

# Occupational Demand

**Table 1. Employment Outlook for Game Design Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Multimedia Artists and Animators | 4,976 | 5,284 | 309 | 6% | 2,328 | 466 | $29.22 | $40.35 |
| Web Developers | 10,785 | 12,579 | 1,794 | 17% | 5,764 | 1,153 | $27.66 | $42.99 |
| Computer Occupations, All Other | 34,144 | 37,249 | 3,105 | 9% | 14,791 | 2,958 | $40.95 | $55.84 |
| **Total** | **49,905** | **55,112** | **5,207** | **10%** | **22,883** | **4,577** | **$36.91** | **$51.52** |

*Source: EMSI 2019.3*

**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 Game Design Occupations in Silicon Valley Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Multimedia Artists and Animators | 1,615 | 1,767 | 152 | 9% | 808 | 162 | $32.85 | $42.21 |
| Web Developers | 3,323 | 3,963 | 640 | 19% | 1,870 | 374 | $29.12 | $41.76 |
| Computer Occupations, All Other | 12,620 | 13,842 | 1,223 | 10% | 5,548 | 1,110 | $46.82 | $64.58 |
| **TOTAL** | **17,557** | **19,572** | **2,015** | **11%** | **8,225** | **1,645** | **$42.19** | **$58.21** |

*Source: EMSI 2019.3*

**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 (December 2018 - November 2019)**

| Occupation | Bay Region | Silicon Valley |
| --- | --- | --- |
| Web Developers | 28,798 | 12,422 |
| Video Game Designers | 1,295 | 430 |
| Multimedia Artists and Animators | 954 | 364 |
| **Total** | **31,047** | **13,216** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Game Design Occupations for latest 12 months (December 2018 - November 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| User Experience (UX) Designer | 3,004 | Engineer | 422 |
| User Interface (UI) Developer | 2,214 | Interaction Designer | 392 |
| Front End Developer | 2,136 | Web Engineer | 357 |
| Web Developer | 1,891 | Ruby on Rails Developer | 327 |
| Software Development Engineer | 1,334 | Developer | 309 |
| User Interface (UX)/User Experience (UX) Designer | 1,128 | PHP Developer | 306 |
| Front End Engineer | 685 | Web Designer | 292 |
| Senior Engineer | 656 | Front End Web Developer | 261 |
| User Interface (UI) Designer | 615 | Web Producer | 228 |
| Ux Researcher | 577 | Javascript Developer | 212 |
| Senior Front End Engineer | 535 | Frontend Engineer | 212 |
| Backend Engineer | 474 | Senior UX Researcher | 211 |
| Java Developer | 469 | Senior UI Engineer | 192 |
| Senior Backend Engineer | 430 | Senior Developer | 191 |

**Table 4b. Top Job Titles for Game Design Occupations for latest 12 months (December 2018 - November 2019) Silicon Valley Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Silicon Valley | Common Title | Silicon Valley |
| User Experience (UX) Designer | 1,273 | Web Engineer | 171 |
| User Interface (UI) Developer | 1,239 | Ruby on Rails Developer | 168 |
| Front End Developer | 1,061 | Developer | 165 |
| Web Developer | 748 | Senior Front End Engineer | 141 |
| Software Development Engineer | 558 | Front End Web Developer | 115 |
| User Interface (UX)/User Experience (UX) Designer | 449 | Javascript Developer | 110 |
| User Interface (UI) Designer | 387 | Senior UI Engineer | 105 |
| Java Developer | 297 | UI Engineer | 98 |
| Front End Engineer | 289 | Python Developer | 97 |
| Backend Engineer | 224 | Senior Backend Engineer | 93 |
| Engineer | 223 | PHP Developer | 92 |
| Ux Researcher | 187 | Backend Developer | 90 |
| Interaction Designer | 177 | Web Applications Developer | 88 |
| Senior Engineer | 176 | Senior Developer | 84 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Game Design Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Custom Computer Programming Services (541511) | 9,792 | 11,015 | 12% | 20% |
| Computer Systems Design Services (541512) | 5,757 | 6,196 | 8% | 11% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 5,498 | 7,006 | 27% | 11% |
| Software Publishers (511210) | 3,640 | 4,364 | 20% | 8% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 2,091 | 2,037 | -3% | 4% |
| Data Processing, Hosting, and Related Services (518210) | 1,974 | 2,463 | 25% | 4% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 1,587 | 1,669 | 5% | 3% |
| Other Computer Related Services (541519) | 1,443 | 1,672 | 16% | 3% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 628 | 667 | 6% | 1% |
| Administrative Management and General Management Consulting Services (541611) | 618 | 738 | 19% | 1% |
| Motion Picture and Video Production (512110) | 595 | 605 | 2% | 1% |
| Temporary Help Services (561320) | 588 | 614 | 4% | 1% |
| Electronic Computer Manufacturing (334111) | 564 | 593 | 5% | 1% |

*Source: EMSI 2019.3*

**Table 6. Top Employers Posting Game Design Occupations in Bay Region and Silicon Valley Sub-Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Silicon Valley |
| Apple Inc. | 256 | Splunk | 69 | Apple Inc. | 241 |
| Google Inc. | 201 | Xoriant Inc | 64 | Cisco Systems Inc | 148 |
| Amazon | 192 | Systems Integration Solutions | 60 | Google Inc. | 141 |
| Cisco Systems Inc | 176 | Salesforce | 59 | IBM | 94 |
| Facebook | 148 | Vmware Inc | 58 | Paypal | 79 |
| Scoop Technologies | 123 | Williams-Sonoma | 57 | Amazon | 62 |
| IBM | 107 | Bayone Solutions | 57 | Systems Integration Solutions | 60 |
| Walmart / Sam's | 93 | Workday, Inc | 56 | Vmware Inc | 58 |
| Specialtys Cafe Bakery | 90 | Jobot | 56 | Osi Engineering | 48 |
| Paypal | 84 | Coinbase | 56 | Xoriant Inc | 45 |
| Adobe Systems | 84 | Uber | 52 | SAP | 45 |
| JP Morgan Chase Co | 80 | eBay | 48 | Intuit | 44 |
| Oracle | 78 | Ascent Technology Services | 48 | Gorilla Logic | 44 |
| Splunk, Inc | 77 | Redolent, Inc | 47 | eBay | 43 |
| SAP | 75 | Wells Fargo | 46 | Walmart / Sam's | 43 |
| Osi Engineering | 70 | Intuit | 45 | Redolent, Inc | 39 |
| NTT Data | 70 | Sony Electronics Inc | 44 | Servicenow | 38 |

*Source: Burning Glass*

# Educational Supply

There is one community college in the Bay Region issuing one award on average annually (last 3 years) on TOP 0614.20 - Electronic Game Design. There are no colleges in the in the Silicon Valley Sub-Region issuing awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0614.20 - Electronic Game Design in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate 18+ units | Certificate Low unit | Total |
| **Santa Rosa Junior College** | North Bay | 1 | 0 | 0 | 1 |
| **Total Bay Region** | | **1** | **0** | **0** | **1** |
| **Total Silicon Valley Sub-Region** | | **0** | **0** | **0** | **0** |

# *Source: Data Mart*

Note: The annual average for awards is 2015-16 to 2017-18.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 4,577 annual openings for the Game Design occupational cluster and one annual (3-year average) awards for an annual undersupply of 4,576 students. In the Silicon Valley Sub-Region, there is also a gap with 1,645 annual openings and no annual (3-year average) awards for an annual undersupply of 1,645 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0614.20 - Electronic Game Design**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay  (All CTE Programs) | Foothill College (All CTE Programs) | State (0614.20) | Bay (0614.20) | Silicon Valley (0614.20) | Foothill College (0614.20) |
| % Employed Four Quarters After Exit | 74% | 77% | 57% | n/a | n/a | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $15,301 | $4,188 | n/a | n/a | n/a |
| Median % Change in Earnings | 46% | 82% | 87% | n/a | n/a | n/a |
| % of Students Earning a Living Wage | 63% | 76% | 32% | n/a | n/a | n/a |

*Source: Launchboard Pipeline (version available on 12/10/19)*

# Skills and Education

**Table 9. Top Skills for Game Design Occupations in Bay Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| JavaScript | 13,539 | UX Wireframes | 3,369 | E-Commerce | 1,871 |
| Java | 6,181 | Git | 3,161 | Agile Development | 1,866 |
| React Javascript | 5,300 | jQuery | 2,947 | Project Management | 1,864 |
| Web Application Development | 5,253 | Node.js | 2,937 | Scrum | 1,864 |
| HTML5 | 5,136 | Prototyping | 2,928 | Human Computer Interaction | 1,858 |
| Web Development | 5,013 | User Research | 2,880 | Product Development | 1,814 |
| Software Engineering | 4,786 | Visual Design | 2,825 | Hypertext Preprocessor (PHP) | 1,804 |
| AngularJS | 4,311 | Product Management | 2,784 | Adobe Indesign | 1,765 |
| Software Development | 4,183 | Interaction Design | 2,628 | JavaScript Object Notation (JSON) | 1,739 |
| Front-end Development | 4,066 | Unit Testing | 2,443 | Cross-browser | 1,716 |
| Python | 3,619 | Web Site Design | 2,393 | Bootstrapping | 1,703 |
| CSS | 3,517 | Object-Oriented Analysis and Design (OOAD) | 2,130 | Adobe Illustrator | 1,601 |
| Adobe Photoshop | 3,492 | Syntactically Awesome Style Sheets (SASS) | 2,047 | Quality Assurance and Control | 1,588 |
| SQL | 3,429 | MySQL | 2,014 | Adobe Acrobat | 1,583 |
| User Interface (UI) Design | 3,427 | AJAX | 1,903 | Adobe Creative Suite | 1,541 |

*Source: Burning Glass*

**Table 10. Education Requirements for Game Design Occupations in Bay Region** Note: 52% 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.

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 276 | 2% |
| Associate Degree | 126 | 1% |
| Bachelor’s Degree or Higher | 13,362 | 97% |

*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/](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

For more information, please contact:

* Doreen O’Donovan, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), [doreen@baccc.net](mailto:doreen@baccc.net) or (831) 479-6481
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, [jcarrese@ccsf.edu](mailto:jcarrese@ccsf.edu) or (415) 267-6544