** Digital Art & Animation Occupations**

**Labor Market Information Report**

**Canada College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

September 2019

# Recommendation

Based on all available data, there appears to be a significant undersupply of Digital Art & Animation workers compared to the demand for this cluster of occupations in the Bay region and in the Mid-Peninsula sub-region (San Francisco and San Mateo Counties.) There is a projected annual gap of about 11,696 students in the Bay region and 4,347 students in the Mid-Peninsula Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 0614.30 - Website Design and Development 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 Canada College and in the region.

# Introduction

This report profiles Digital Art & Animation Occupations in the 12 county Bay region and in the Mid-Peninsula sub-region for a proposed new program at Canada College.

|  |
| --- |
| * **Software Developers, Applications (SOC 15-1132):** Develop, create, andmodify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers. |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 13% |
|  |
| * **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*%* |

# Occupational Demand

**Table 1. Employment Outlook for Digital Art & Animation Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Software Developers, Applications | 93,606 | 113,716 | 20,110 | 21% | 52,603 | 10,521 | $39.30 | $63.42 |
| Web Developers | 10,806 | 12,763 | 1,958 | 18% | 6,019 | 1,204 | $17.73 | $43.05 |
| **Total** | **104,412** | **126,479** | **22,067** | **21%** | **58,622** | **11,724** | **$37.07** | **$61.31** |

*Source: EMSI 2019.2*

**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 Digital Art & Animation Occupations in Mid-Peninsula Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Software Developers, Applications | 29,192 | 37,768 | 8,576 | 29% | 19,048 | 3,810 | $42.33 | $70.55 |
| Web Developers | 4,477 | 5,466 | 989 | 22% | 2,701 | 540 | $23.37 | $50.33 |
| **TOTAL** | **33,669** | **43,234** | **9,565** | **28%** | **21,749** | **4,350** | **$39.81** | **$67.87** |

*Source: EMSI 2019.2*

**Mid-Peninsula Sub-Region** includes San Francisco and San Mateo Counties

### Job Postings in Bay Region and Mid-Peninsula Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Sept 2018 - Aug 2019)**

| Occupation | Bay Region | Mid-Peninsula |
| --- | --- | --- |
| Software Developers, Applications | 124,485 | 46,480 |
| Web Developers | 28,225 | 12,663 |
| **Total** | **152,710** | **59,143** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Digital Art & Animation Occupations for latest 12 months (Sept 2018 - Aug 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Software Development Engineer | 36,686 | Engineer | 1,653 |
| Java Developer | 9,794 | Applications Developer | 1,636 |
| Devops Engineer | 4,481 | Senior Engineer | 1,457 |
| Software Developer | 3,622 | Principal Software Engineer | 1,455 |
| Applications Engineer | 3,369 | iOS Developer | 1,281 |
| User Experience (UX) Designer | 3,150 | Senior Devops Engineer | 1,236 |
| Java Engineer | 2,853 | .Net Developer | 1,145 |
| Python Developer | 2,375 | User Interface (UX)/User Experience (UX) Designer | 1,113 |
| Front End Developer | 2,261 | Software Engineering Manager | 1,031 |
| User Interface (UI) Developer | 2,134 | Salesforce Developer | 847 |
| Senior Developer | 2,047 | Full Stack Developer | 816 |
| Developer | 2,009 | Software Architect | 813 |
| Web Developer | 1,888 | Full Stack Engineer | 659 |
| Android Developer | 1,859 | C++ Developer | 659 |

**Table 4b. Top Job Titles for Digital Art & Animation Occupations for latest 12 months (Sept 2018 - Aug 2019) Mid-Peninsula Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Mid-Peninsula | Common Title | Mid-Peninsula |
| Software Development Engineer | 15,610 | Python Developer | 620 |
| Java Developer | 2,372 | Applications Developer | 615 |
| Devops Engineer | 1,541 | Engineer | 592 |
| User Experience (UX) Designer | 1,466 | Senior Devops Engineer | 564 |
| Software Developer | 1,218 | User Interface (UX)/User Experience (UX) Designer | 547 |
| Java Engineer | 942 | User Interface (UI) Developer | 532 |
| Senior Engineer | 848 | Software Engineering Manager | 529 |
| Applications Engineer | 834 | iOS Developer | 499 |
| Senior Developer | 810 | .Net Developer | 411 |
| Front End Developer | 797 | Salesforce Developer | 381 |
| Web Developer | 687 | Solutions Engineer | 361 |
| Developer | 682 | Ux Researcher | 343 |
| Android Developer | 673 | Full Stack Engineer | 340 |
| Principal Software Engineer | 626 | Front End Engineer | 336 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Digital Art & Animation 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) | 22,193 | 27,147 | 22% | 21% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 15,111 | 21,120 | 40% | 14% |
| Computer Systems Design Services (541512) | 13,885 | 16,679 | 20% | 13% |
| Software Publishers (511210) | 12,820 | 15,995 | 25% | 12% |
| Electronic Computer Manufacturing (334111) | 6,772 | 7,450 | 10% | 6% |
| Data Processing, Hosting, and Related Services (518210) | 4,396 | 5,993 | 36% | 4% |
| Other Computer Related Services (541519) | 2,950 | 3,777 | 28% | 3% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 2,586 | 2,914 | 13% | 2% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,104 | 1,091 | -1% | 1% |
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| Corporate, Subsidiary, and Regional Managing Offices (551114) | 2,586 | 2,914 | 13% | 2% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,104 | 1,091 | -1% | 1% |

*Source: EMSI 2019.2*

**Table 6. Top Employers Posting Digital Art & Animation Occupations in Bay Region and Mid-Peninsula Sub-Region (Sept 2018 - Aug 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | Mid-Peninsula |
| Apple Inc. | 2,132 | Intel Corporation | 311 | Facebook | 759 |
| Amazon | 1,356 | Microsoft Corporation | 301 | Amazon | 540 |
| Cisco Systems Incorporated | 1,337 | Xoriant Incorporated | 275 | Oracle | 435 |
| Scoop Technologies | 982 | Splunk, Inc | 275 | Scoop Technologies | 429 |
| Facebook | 817 | Intuit | 274 | Salesforce | 347 |
| Workday, Inc | 654 | eBay | 273 | Uber | 295 |
| Oracle | 632 | Wipro | 260 | Visa | 286 |
| Google Inc. | 569 | Verizon Communications Incorporated | 250 | Twitter | 217 |
| IBM | 557 | Intelliswift Software | 242 | SAP | 199 |
| Paypal | 453 | Amazon Lab126 | 239 | Sony Electronics Incorporated | 197 |
| Walmart / Sam's | 449 | Twitter | 223 | Cisco Systems Incorporated | 170 |
| SAP | 449 | Vmware Incorporated | 222 | Airbnb | 168 |
| Uber | 375 | Servicenow | 221 | Capital One | 167 |
| Adobe Systems | 368 | Bayone Solutions | 219 | AppDynamics | 162 |
| Salesforce | 358 | Sony Electronics Incorporated | 214 | Google Inc. | 161 |
| Visa | 353 | NTT Data | 214 | Splunk, Inc | 150 |
| Splunk | 336 | Redolent, Inc | 208 | IBM | 147 |

*Source: Burning Glass*

# Educational Supply

There are six (6) colleges in the Bay Region issuing 28 awards on average annually (last 3 years) on TOP 0614.30 - Website Design and Development. There is one college (Skyline College) in the Mid-Peninsula Sub-Region issuing 3 awards on average annually (last 3 years) on this TOP code.

**Table 7. Awards on TOP 0614.30 - Website Design and Development in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificates | Noncredit | Total |
| Berkeley City College | East Bay | 2 | - | - | 2 |
| Cabrillo College | Santa Cruz - Monterey | 6 | 6 | - | 12 |
| Mission College | Silicon Valley | - | 5 | - | 5 |
| San Jose City College | Silicon Valley | 2 | 2 | - | 4 |
| Skyline College | Mid-Peninsula | 2 | 1 | - | 3 |
| West Valley College | Silicon Valley | - | 2 | - | 2 |
| **Total Bay Region** | | **12** | **16** | **0** | **28** |
| **Total Mid-Peninsula Sub-Region** | | **2** | **1** | **0** | **3** |

# *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 11,724 annual openings for the Digital Art & Animation occupational cluster and 28 annual (3-year average) awards for an annual undersupply of 11,696 students. In the Mid-Peninsula Sub-Region, there is also a gap with 4,350 annual openings and 3 annual (3-year average) awards for an annual undersupply of 4,347 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0614.30 - Website Design and Development**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay  (All CTE Programs) | Canada College (All CTE Programs) | State (0614.30) | Bay (0614.30) | Mid-Peninsula (0614.30) | Canada College (0614.30) |
| % Employed Four Quarters After Exit | 74% | 66% | 60% | 62% | n/a | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $9,520 | $8,598 | $9,239 | $5,740 | n/a |
| Median % Change in Earnings | 46% | 44% | 53% | 72% | n/a | n/a |
| % of Students Earning a Living Wage | 63% | 49% | 56% | 58% | n/a | n/a |

*Source: Launchboard Pipeline (version available on 9/13/19)*

# Skills, Certifications and Education

**Table 9. Top Skills for Digital Art & Animation Occupations in Bay Region (Sept 2018 - Aug 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Java | 58,007 | React Javascript | 12,280 | Software Architecture | 9,257 |
| Software Engineering | 54,049 | AngularJS | 12,148 | Microsoft C# | 9,136 |
| JavaScript | 40,189 | Scrum | 11,650 | JavaScript Object Notation (JSON) | 8,959 |
| Software Development | 39,530 | HTML5 | 11,535 | Product Management | 8,810 |
| Python | 38,205 | Continuous Integration (CI) | 11,525 | Apache Kafka | 8,776 |
| SQL | 28,872 | NoSQL | 11,465 | jQuery | 8,692 |
| Linux | 22,402 | Data Structures | 11,140 | Web Development | 8,675 |
| C++ | 21,708 | Agile Development | 10,959 | Extensible Markup Language (XML) | 8,458 |
| Git | 18,488 | MySQL | 10,928 | Machine Learning | 8,429 |
| Object-Oriented Analysis and Design (OOAD) | 15,929 | UNIX | 10,763 | Relational Databases | 8,331 |
| DevOps | 15,572 | Kubernetes | 10,607 | Big Data | 8,039 |
| Debugging | 15,229 | Docker Software | 9,839 | Apache Hadoop | 7,885 |
| Web Application Development | 15,144 | Scalability Design | 9,631 | Ruby | 7,748 |
| Unit Testing | 13,987 | Quality Assurance and Control | 9,622 | Project Management | 7,587 |
| Oracle | 12,848 | Node.js | 9,284 | Product Development | 7,567 |

*Source: Burning Glass*

**Table 10. Certifications for Digital Art & Animation Occupations in Bay Region (Sept 2018 - Aug 2019)**

Note: 96% 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.

|  |  |  |  |
| --- | --- | --- | --- |
| Certification | Postings | Certification | Postings |
| Security Clearance | 1,927 | Cisco Certified Network Professional | 188 |
| IT Infrastructure Library (ITIL) Certification | 631 | Certified Salesforce Platform Developer II | 181 |
| Driver's License | 373 | SANS/GIAC Certification | 167 |
| Project Management Certification | 337 | Certified Salesforce Advanced Administrator | 130 |
| Certified Salesforce Platform Developer | 298 | Project Management Professional (PMP) | 104 |
| Certified Information Systems Security Professional | 287 | Certified Salesforce Platform Developer I | 104 |
| Salesforce Developer | 246 | Certified ScrumMaster (CSM) | 99 |
| Cisco Certified Internetwork Expert (CCIE) | 236 | Certified Scrum Professional (CSP) | 93 |
| Cisco Certified Network Associate (CCNA) | 234 | Certified Salesforce Advanced Developer | 92 |
| ITIL Certification | 210 | Salesforce Platform App Builder | 87 |
| Certified Salesforce Administrator | 194 | Certified Information Systems Auditor | 87 |
| CompTIA Security+ | 193 | Microsoft Certified Professional (MCP) | 76 |

*Source: Burning Glass*

**Table 11. Education Requirements for Digital Art & Animation Occupations in Bay Region**

Note: 48% 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 | 893 | 1% |
| Associate Degree | 465 | 1% |
| Bachelor’s Degree or Higher | 72,695 | 98% |

*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

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