Labor Market Analysis for Program Recommendation
Gaming Design Occupations
Cabrillo College

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

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Recommendation

Based on all available data, there appears to be an "undersupply" of Gaming Design workers compared to the demand for this cluster of occupations in the Bay region and in the SC-Monterey sub-region (Monterey, San Benito, Santa Cruz counties). There is a projected annual gap of about 16,773 students in the Bay region and 59 students in the SC-Monterey Sub-Region.

Introduction

This report provides student outcomes data on employment and earnings for TOP 0614.20 - Electronic Game Design 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 Cabrillo College and in the region.

This report profiles Gaming Design Occupations in the 12 county Bay region and in the SC-Monterey sub-region for a regional program recommendation at Cabrillo College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Video Game Designers (15-1255.01), therefore, the data shown in Tables 1 and 2 is for Web and Digital Interface Designers (at the six digit SOC level) and likely overstates demand for Video Game Designers.

- **Software Developers (15-1252):** Research, design, and develop computer and network software or specialized utility programs. Analyze user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. Update software or enhance existing software capabilities. May work with computer hardware engineers to integrate hardware and software systems, and develop specifications and performance requirements. May maintain databases within an application area, working individually or coordinating database development as part of a team.
  Entry-Level Educational Requirement: Bachelor's degree
  Training Requirement: None
  Percentage of Community College Award Holders or Some Postsecondary Coursework: 11%

- **Web and Digital Interface Designers (15-1255):** Design digital user interfaces or websites. Develop and test layouts, interfaces, functionality, and navigation menus to ensure compatibility and usability across browsers or devices. May use web framework applications as well as client-side code and processes. May evaluate web design following web and accessibility standards, and may analyze web use metrics and optimize websites for marketability and search engine ranking. May design and test interfaces that facilitate the human-computer interaction and maximize the usability of digital devices, websites, and software with a focus on aesthetics and design. May create graphics used in websites and manage website content and links.
  Entry-Level Educational Requirement: Bachelor's degree

Training Requirement: None

Percentage of Community College Award Holders or Some Postsecondary Coursework: 23%

- **Special Effects Artists and Animators (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: 26%

- **Graphic Designers (27-1024):** Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

  Entry-Level Educational Requirement: Bachelor's degree

  Training Requirement: None

  Percentage of Community College Award Holders or Some Postsecondary Coursework: 26%

- **Audio and Video Technicians (27-4011):** Set up, or set up and operate audio and video equipment including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences. May also set up and operate associated spotlights and other custom lighting systems. Excludes "Sound Engineering Technicians" (27-4014).

  Entry-Level Educational Requirement: Postsecondary nondegree award

  Training Requirement: Short-term on-the-job training

  Percentage of Community College Award Holders or Some Postsecondary Coursework: 39%

Occupational Demand

Table 1. Employment Outlook for Gaming Design Occupations in Bay Region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Software Developers	136,967	162,457	25,490	19%	74,158	14,832	$62	$79
Web and Digital Interface Designers	5,549	6,581	1,032	19%	3,520	704	$42	$62
Special Effects Artists and Animators	2,247	2,391	145	6%	1,381	276	$37	$52
Graphic Designers	7,554	8,006	451	6%	3,964	793	$26	$36
Audio and Video Technicians	2,384	2,723	338	14%	1,553	311	$21	$28
Total	**154,701**	**182,157**	**27,456**	**18%**	**84,576**	**16,916**		

Source: Lightcast 2022.3

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 Gaming Design Occupations in SC-Monterey Sub-region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Software Developers	919	1,065	146	16%	471	94	$42	$56
Web and Digital Interface Designers	84	88	3	4%	40	8	$23	$31
Special Effects Artists and Animators	44	42	-2	-5%	23	5	$34	$55
Graphic Designers	256	278	22	9%	143	29	$23	$30

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Audio and Video Technicians	110	134	24	22%	82	16	$20	$23
Total	**1,413**	**1,606**	**193**	**14%**	**760**	**152**		

Source: Lightcast 2022.3

SC-Monterey Sub-Region includes: Monterey, San Benito, Santa Cruz Counties

Job Postings in Bay Region and SC-Monterey Sub-Region
Table 3. Number of Job Postings by Occupation for latest 12 months

Occupation	Bay Region	SC-Monterey
Software Developers	54,421	453
Graphic Designers	1,591	52
Web and Digital Interface Designers	758	13
Audio and Video Technicians	673	60
Special Effects Artists and Animators	378	3

Source: Lightcast

Table 4a. Top Job Titles for Gaming Design Occupations for latest 12 months - Bay Region

Title	Bay	Title	Bay
Software Engineers	5,075	Infrastructure Software Engineers	683
DevOps Engineers	1,340	iOS Developers	674
Full Stack Software Engineers	1,261	Embedded Software Engineers	639
Staff Software Engineers	1,186	Software Engineering Managers	623
Principal Software Engineers	1,068	Platform Software Engineers	604
Back End Software Engineers	960	Software Developers	588
Java Developers	884	Full Stack Engineers	580
Software Development Engineers	762	Full Stack Developers	578
Android Developers	735	Lead Software Engineers	549

Source: Lightcast

Table 4b. Top Job Titles for Gaming Design Occupations for latest 12 months - SC-Monterey Sub-Region

Title	SC-Monterey	Title	SC-Monterey
Software Engineers	46	Full Stack Software Engineers	8
Audiovisual Technicians	31	Instructional Technology Specialists	8
Graphic Designers	18	Software Developers	8

Title	SC-Monterey	Title	SC-Monterey
Software Verification Engineers	16	Java Developers	7
DevOps Engineers	11	Audio/Video Technicians	6
Soc Design Engineers	10	Lecturers in Computer Science	6
Verification and Validation Engineers	10	Salesforce Developers	6
Application Developers	9	Application Engineers	5
Embedded Software Engineers	9	Computer Science Engineers	5

Source: Lightcast

Industry Concentration

Table 5. Industries hiring Gaming Design Workers in Bay Region

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2021)	Jobs in Industry (2026)	% Change (2021-26)	% Occupation Group in Industry (2022)
Custom Computer Programming Services	30,651	41,603	36%	20%
Software Publishers	21,602	26,787	24%	13%
Computer Systems Design Services	16,985	19,454	15%	10%
Web Search Portals and All Other Information Services	17,690	22,171	25%	10%
Electronic Computer Manufacturing	9,821	11,027	12%	5%
Data Processing, Hosting, and Related Services	6,516	11,956	83%	5%
Media Streaming Distribution Services, Social Networks, and Other Media Networks and Content Providers	4,934	6,118	24%	3%
Other Computer Related Services	3,913	4,733	21%	2%
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	3,531	4,791	36%	2%
Corporate, Subsidiary, and Regional Managing Offices	3,128	3,326	6%	2%

Source: Lightcast 2022.3

Table 6. Top Employers Posting Gaming Design Occupations in Bay Region and SC-Monterey Sub-Region

Employer	Bay	Employer	SC-Monterey
Apple	1,405	Intel	56
Google	1,089	Joby Aviation	51
CyberCoders	717	University of California	39
Capital One	701	Driscoll's	17

Employer	Bay	Employer	SC-Monterey
Motion Recruitment	679	eBay	17
Amazon	620	Encore Global	13

Source: Lightcast

Educational Supply

There are three (3) community colleges in the Bay Region issuing 16 awards on average annually (last 3 years ending 2021-22) on TOP 0614.20 - Electronic Game Design. In the SC-Monterey Sub-Region, there are no community colleges that issued awards on average annually (last 3 years) on this TOP code.

There are two (2) other CTE educational institutions in the Bay Region issuing 34 awards on average annually (last 3 years ending 2021-22) on CIP 50.0411 - Game and Interactive Media Design. There are no other CTE educational institutions in the SC-Monterey Sub-Region issuing awards on average annually (last 3 years) on this CIP code.

There is a one (1) four-year institution in the Bay Region and SC-Monterey Sub-Region issuing 93 Bachelor's degrees on average annually (last 3 years ending 2021-22) on CIP 50.0411 - Game and Interactive Media Design.

Table 7a. Community College Awards on TOP 0614.20 - Electronic Game Design in Bay Region

College	Subregion	Associate Degree	High unit Certificate	Low unit Certificate	Total
Diablo Valley	East Bay	5	2	0	7
Foothill	Silicon Valley	0	0	1	1
Santa Rosa	North Bay	5	0	3	8
Total		**10**	**2**	**4**	**16**

Source: Data Mart

Note: The annual average for awards is 2019-20 to 2021-22.

Table 7b. Other CTE Institutions Awards on CIP 50.0411 - Game and Interactive Media Design in Bay Region

College	Subregion	Bachelor's degree	Total
SAE Expression College	East Bay	10	10
University of Silicon Valley	Silicon Valley	24	24
Total		**34**	**34**

Source: Data Mart

Note: The annual average for awards is 2019-20 to 2021-22.

Table 7c. Bachelor's Degree Awards on CIP 50.0411 - Game and Interactive Media Design in Bay Region

College	Subregion	Bachelor's degree	Total
University of California-Santa Cruz	SC-Monterey	93	93
Total		**93**	**93**

Source: Data Mart

Note: The annual average for awards is 2019-20 to 2021-22.

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 16,916 annual openings for the Gaming Design Certificate of Achievement occupational cluster and 143 annual (3-year average)

awards for an annual undersupply of 16,773 students. In the SC-Monterey Sub-Region, there is also a gap with 152 annual openings and 93 annual (3-year average) awards for an annual undersupply of 59 students.

Student Outcomes

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

Metric Outcomes	Bay All CTE Programs	Cabrillo All CTE Programs	State 0614.20	Bay 0614.20	SC-Monterey 0614.20	Cabrillo 0614.20
Students with a Job Closely Related to Their Field of Study	74%	80%	50%	68%	N/A	N/A
Median Annual Earnings for SWP Exiting Students	$53,090	$46,381	$26,491	$33,220	N/A	N/A
Median Change in Earnings for SWP Exiting Students	24%	23%	39%	25%	N/A	N/A
Exiting Students Who Attained the Living Wage	54%	44%	33%	37%	N/A	N/A

Source: Launchboard Strong Workforce Program Median of 2018 to 2021.

Skills, Certifications and Education

Table 9. Top Skills for Gaming Design Occupations in Bay Region

Skill	Posting	Skill	Posting
Software Engineering	22,451	C++ (Programming Language)	10,413
Computer Science	22,085	JavaScript (Programming Language)	9,793
Python (Programming Language)	17,828	SQL (Programming Language)	8,709
Software Development	16,154	Automation	8,539
Java (Programming Language)	15,135	Kubernetes	7,248
Agile Methodology	11,046	Algorithms	7,215
Application Programming Interface (API)	10,831	Linux	7,159
Amazon Web Services	10,824	React.js (Javascript Library)	6,530
Scalability	10,758	CI/CD	6,510
Debugging	10,565	Git (Version Control System)	6,488

Source: Lightcast

Table 10. Certifications for Gaming Design Occupations in Bay Region

Certification	Posting	Certification	Posting
Security Clearance	1,072	Top Secret Clearance	197

Certification	Posting	Certification	Posting
Enterprise Desktop Administrator (Microsoft Certified IT Professional)	681	DO-178B/C (Software Considerations in Airborne Systems and Equipment Certification)	193
Valid Driver's License	588	Functional Skills Qualification	175
Software Development Engineer in Test	461	Certified Information Systems Security Professional	158
Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)	418	Salesforce Certified Administrator	127
Salesforce Certification	356	Project Management Professional Certification	120
Master of Business Administration (MBA)	304	Salesforce Certified Platform Developer II	113
Secret Clearance	265	Cisco Certified Network Associate	100

Source: Lightcast

Table 11. Education Requirements for Gaming Design Occupations in Bay Region

Education Level	Job Postings	% of Total
High school or GED	726	1%
Associate degree	740	1%
Bachelor's degree & higher	48,201	97%

Source: Lightcast

Note: 44% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample.

Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCCO Data Mart and CTE Launchboard.

Sources

O*Net Online
Lightcast
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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