Electronic Game Design

Inland Empire/Desert Region (Riverside and San Bernardino counties)

Summary

Electronic Game Design
(TOP 0614.20)
Community College Program

→

Provides training for
3 **Bachelor's Degree-level**
1 **Community College-level**
Occupations
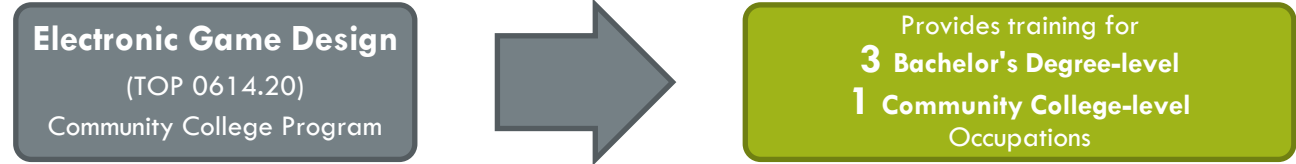
Over the next five years (2021-2026), community-college-level electronic game design employment is projected to

Increase Employment by
20%

45
Annual Job Openings

Median Hourly Earnings
$25.15
Above the Hourly Living Wage Standard
($21.82)

42 **Total Annual Awards**
In Programs related to Electronic Game Design

42
Program Awards from Community College Programs

0
Program Awards from Other Postsecondary Education Providers

The Inland Empire/Desert Centers of Excellence

👍 **Recommends**

electronic game design program expansion
to meet the need for more workers in the region

Introduction

This report provides data on programs and occupations related to game development. The California Community College program most likely to prepare students for employment in game development is the electronic game design (TOP 0614.20) program. The California Community College Taxonomy of Programs does not provide a detailed definition for electronic game design programs. However, Norco College uses this program code for its Game Design program; the program description may provide greater insight into electronic game design programs.

Students completing game design programs will be well versed in the process by which games and game assets are designed and created, with a special emphasis on planning, building, testing, and documenting mechanical and economic systems and elements for a range of game types and platforms. These programs prepare

students to enter the field with a versatile skill set and gain employment as game designers (Norco College, 2023).

The knowledge, skills, and abilities trained by electronic game design programs lead to four distinct occupations and one emerging occupation, collectively referred to as the electronic game design occupational group in this report. The electronic game design occupational group is separated into community college-level and bachelor's degree-level occupations to illuminate job opportunities for individuals with varying education levels.

The **community college-level electronic game design occupation** in this report typically requires a bachelor's degree. However, approximately 24% of incumbent workers in these occupations have a community college-level education, some college or an associate degree, as their highest level of education. The occupation, video game designers, is an emerging occupation embedded within the broader occupation of web and digital interface designers. Due to the emerging nature of this occupation, traditional labor market information is not available for video game designers. The community college-level occupations included in the electronic game design occupational group are:

- Web and Digital Interface Designers (SOC 15-1255)
  - Video Game Designers (15-1255.01)

The **bachelor's degree-level electronic game design occupations** included in this report typically require workers to obtain a bachelor's degree before employment. Students enrolled in an electronic game design program may gain transferable skills. Between 11% and 27% of incumbent bachelor's degree-level occupations hold a community college-level of educational attainment. The bachelor's degree-level electronic game design occupations included in this report are:

- Computer Programmers (SOC 27-2012)
- Software Developers (27-1027)
- Special Effects Artists and Animators (27-1014)

This report's educational supply and employment demand portions focus solely on the community college-level jobs students are likely to obtain after completing a community college electronic game design program.

Job Counts and Projections

In 2021, there were 4,500 total electronic game design jobs in the region; approximately 8% of regional electronic game design jobs are community college-level, and 92% are bachelor's degree-level. By 2026, community college-level employment is projected to increase by 20%; 45 job openings are expected annually due to the region's new job growth and replacement needs. Exhibit 1 displays the job counts, five-year projected job growth, openings, and the share of incumbent workers aged 55 years and older.

Exhibit 1: Five-year projections for the electronic game design occupational group, Inland Empire/Desert Region, 2021-2026

Occupation	2021 Jobs	2026 Jobs	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Bachelor's Degree-level						
Software Developers	3,370	4,146	23%	2,001	400	15%
Computer Programmers	626	646	3%	238	48	21%
Special Effects Artists and Animators	161	174	8%	104	21	30%
Bachelor's Degree-level Total	**4,156**	**4,966**	**19%**	**2,343**	**469**	**16%**
Community College-level						
Web and Digital Interface Designers	344	412	20%	223	45	29%
Community College-level Total	**344**	**412**	**20%**	**223**	**45**	**29%**
Total	**4,500**	**5,378**	**20%**	**2,566**	**513**	**16%**

Source: Lightcast 2023.1

An online job advertisement (ad) search for jobs in the electronic game design occupational group revealed the employers seeking these workers, including the median posting duration, earnings information, and in-demand skills. Over the last 12 months, there were 39 job ads posted for the electronic game design occupational group in the region. To ensure the generalizability of the job ad information displayed in this report, the search was expanded to include all ads posted in California over the last 12 months.

Over the previous 12 months, there were 2,597 job ads posted for the electronic game design occupational group in the state. Nearly 2% of statewide job postings were listed in the Inland Empire/Desert Region, indicating there are more employment opportunities available to individuals willing to commute out of the region. More than half of the statewide job ads (55%) for the electronic game design occupational group were posted in the neighboring Metropolitan Statistical Areas (MSA) of Los Angeles-Long Beach-Anaheim MSA and San Diego-Chula Vista-Carlsbad MSA, accounting for 41% and 14% of statewide demand respectively.

Exhibit 2 shows the number of job ads posted during the last 12 months and the statewide average median posting duration for these jobs. On average, employers in the state filled online job ads for the electronic game design occupational group in 25 days. The average statewide online job is open for 27 days, indicating that it may be easier for employers to fill electronic game design jobs than other jobs. The majority of job ads were for software developers.

Exhibit 2: Job ads and median posting duration, California, March 2022 – February 2023

Occupation	Job Ads	Median Posting Duration (Days)
Bachelor's Degree-level		
Software Developers	2,080	25
Computer Programmers	144	24
Special Effects Artists and Animators	139	29
Bachelor's Degree-level	**2,363**	**25**
Community College-level		
Web and Digital Interface Designers Video Game Designers	234	25
Community College-level Total	**234**	**25**
Total	**2,597**	**25**

Source: Burning Glass – Labor Insights

Earnings

Community colleges should ensure their training programs lead to employment opportunities that provide a living wage. The MIT living wage calculator estimates that an individual must earn $21.82 per hour or $45,386 annually in California to be self-sufficient (Glasmeier, 2023).

Exhibit 3 displays the hourly earnings for the bachelor's degree-level electronic game design occupational group in the Inland Empire/Desert Region. The 10th percentile hourly earnings for the bachelor's degree-level electronic game design occupational group surpass the living wage standard, indicating that at least 90% of workers earn a living wage.

Exhibit 3: Hourly earnings by percentile for the bachelor's degree-level electronic game design occupational group, Inland Empire/Desert Region, 2021
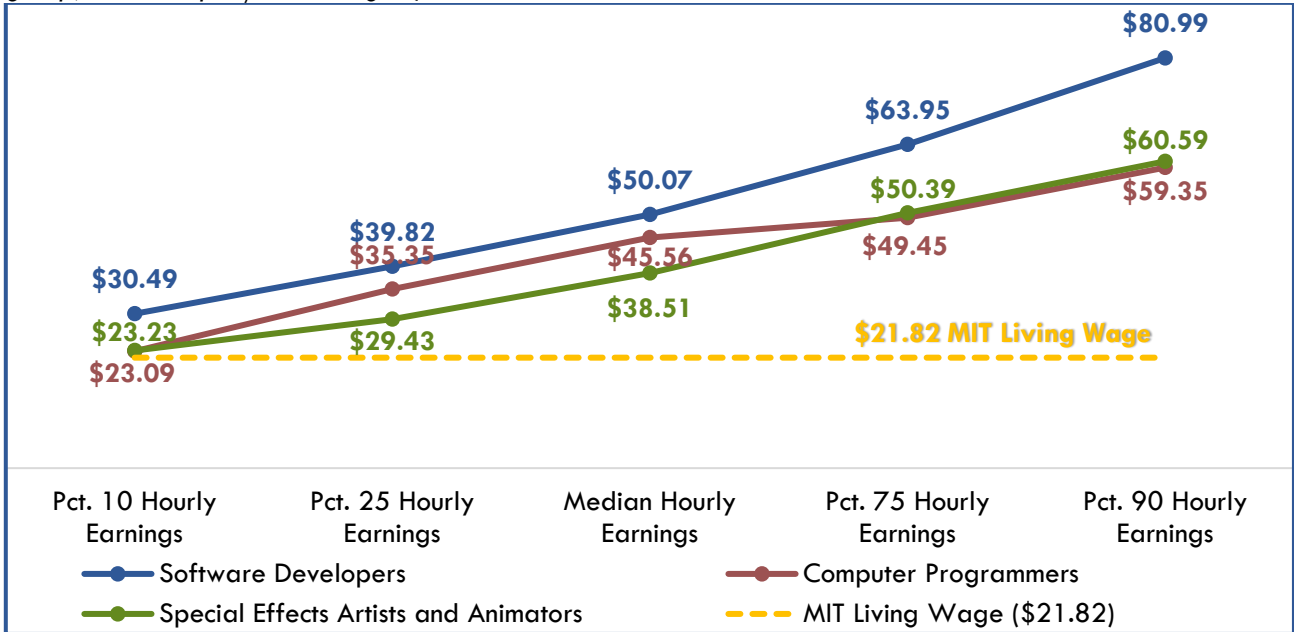
Source: Lightcast 2023.1

Exhibit 4 displays the hourly earnings for the community college-level occupation, web and digital interface designers, in the Inland Empire/Desert Region. The median hourly earnings for web and digital interface designers are above the living wage standard, indicating that only the top 50% of workers earn a living wage.

*Exhibit 4: Hourly earnings by percentile for web and digital interface designers, Inland Empire/Desert Region, 2021*
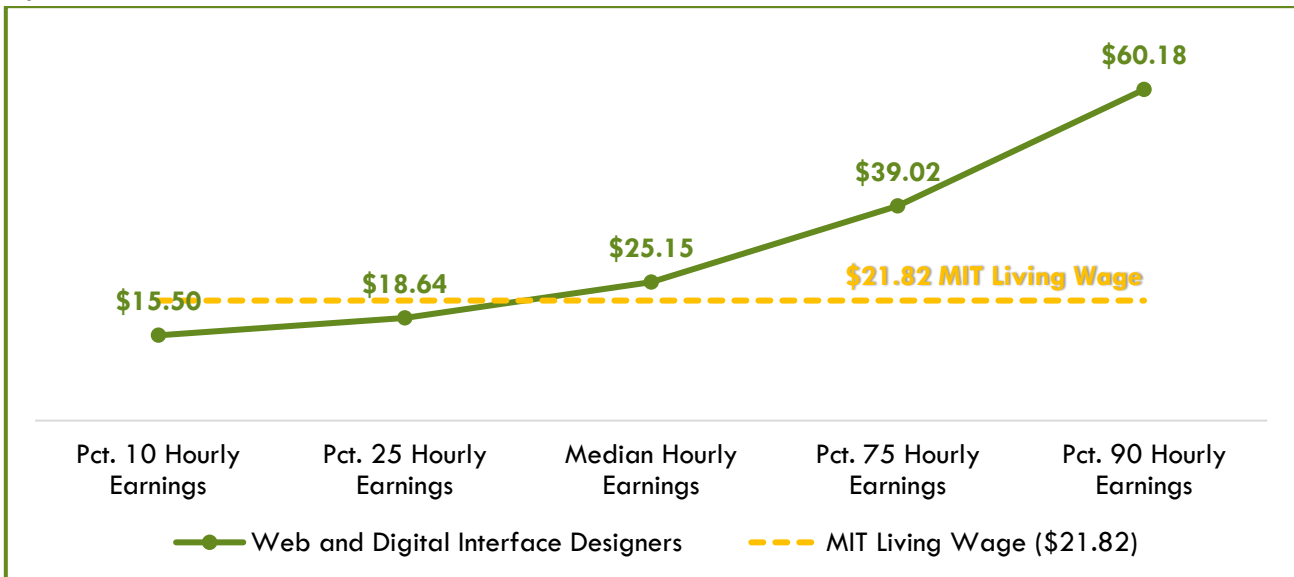
Source: Lightcast 2023.1

Advertised Salary from Online Job Ads

Exhibit 5 displays online job ad salary data for the electronic game design occupational group over the last 12 months. Online job ad salary information reveals that employers are willing to pay the electronic game design workers $140,000 annually, well above the region's $45,386 annual ($21.82 hourly) living wage standard. Consider the salary information with caution since only 13% (337 out of 2,597) of online job ads for these occupations provided salary information. The salary figures are prorated to reflect full-time, annual wage status.

Exhibit 5: Advertised salary information, California, March 2022 – February 2023
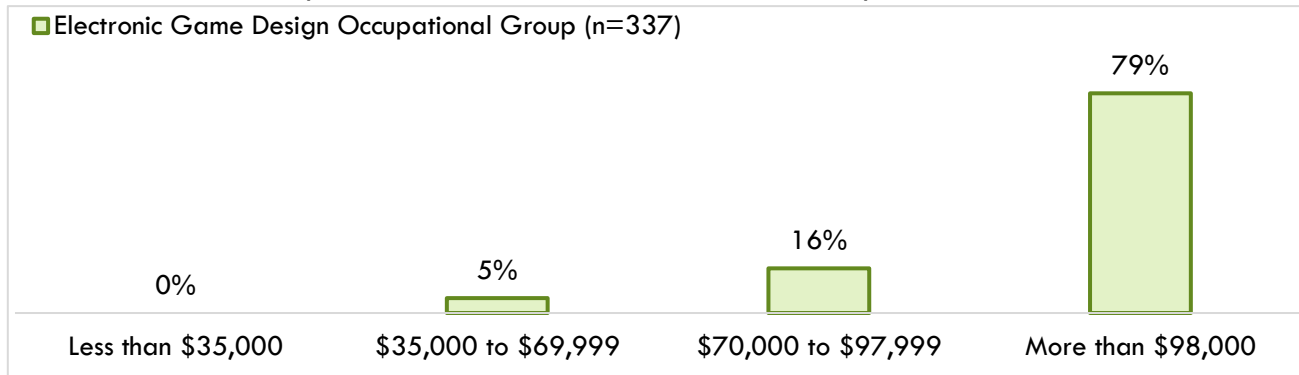
Source: Burning Glass – Labor Insights

Job Titles, Employers, Skills, Education, and Work Experience

Exhibit 6 displays the job titles most frequently included in ads for the electronic game design occupational group over the last 12 months. Displaying job titles may provide insight into the positions available to students after completing a program. The most frequently sought job title was software engineer, followed by gameplay engineer.

Exhibit 6: Job titles most frequently included in job ads for the electronic game design occupational group, California, March 2022 – February 2023

Job Titles	Job Ads
Software Engineers	359
Gameplay Engineers	96
Back End Software Engineers	73
Software Development Engineers	63
Staff Software Engineers	48
Full Stack Software Engineers	45
Graphics Software Engineers	43
All other job titles	*1,870*
Total	**2,597**

Source: Burning Glass – Labor Insights

Exhibit 7 displays the employers that posted the most job ads during the last 12 months. Showing employer names provides insight into where students may find employment after completing a program. Sony posted the most job advertisements for the electronic game design occupational group over the last 12 months in California.

Exhibit 7: Employers posting the most job ads for the electronic game design occupational group, California, March 2022 – February 2023

Employers	Job Ads
Sony	210
Amazon	188
Niantic, Inc.	130
Activision Blizzard	105
Riot Games	92
Disney	98
Electronic Arts	72
Apple	71
Qualcomm	63
Meta	53
Pocket Gems	51
Roblox	36
All other employers	*1,428*
Total	**2,597**

Source: Burning Glass – Labor Insights

Exhibit 8 lists a sample of specialized, employability, and software and programming skills employers seek for workers to fill positions in the electronic game design occupational group. Specialized skills are occupation-specific skills that employers request for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job ads may be utilized to guide curriculum development.

Exhibit 8: Sample of in-demand skills from employer job ads, California, March 2022 – February 2023

Specialized skills	Employability skills	Software and Programming skills
• Software Engineering	• Communication Skills	• C++
• Debugging	• Problem-Solving	• Python
• Algorithms	• Leadership	• Java
• Code Review	• Management	• Unity Engine
• Video Game Development	• Troubleshooting	• Unreal Engine

Specialized skills	Employability skills	Software and Programming skills
• Animations	• Research	• SQL

Source: Burning Glass – Labor Insights

Exhibit 9 displays the minimum advertised education requirements for the electronic game design occupational group. The vast majority of job ads (96%) for the electronic game design occupational group sought candidates with a bachelor's degree.

Exhibit 9: Minimum advertised education requirements for the electronic game design occupational group, California, March 2022 – February 2023

Electronic Game Design Occupational Group (n=2,597)

High school or GED	2%
Associate degree	1%
Bachelor's degree	96%
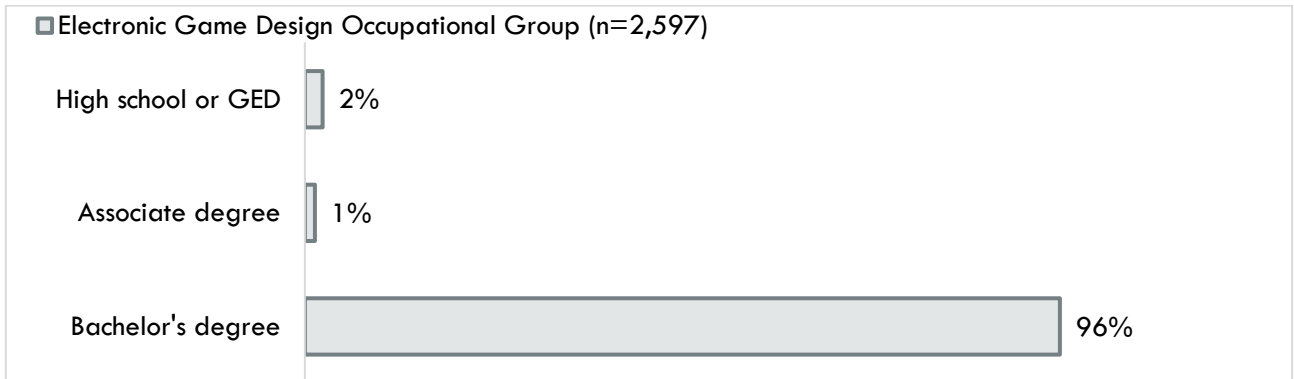
Source: Burning Glass – Labor Insights

Exhibit 10 displays the real-time work experience requirements from employer job ads. Approximately 21% of employers did not include work experience requirements in job ads. Of the employers with job ad experience requirements, approximately 62% of employers sought candidates with four years or more of previous work experience.

Exhibit 10: Real-time work experience requirements, California, March 2022 – February 2023

Electronic Game Design Occupational Group (n=2,064)

0 to 1 year	2 to 3 years	4+ years
6%	32%	62%
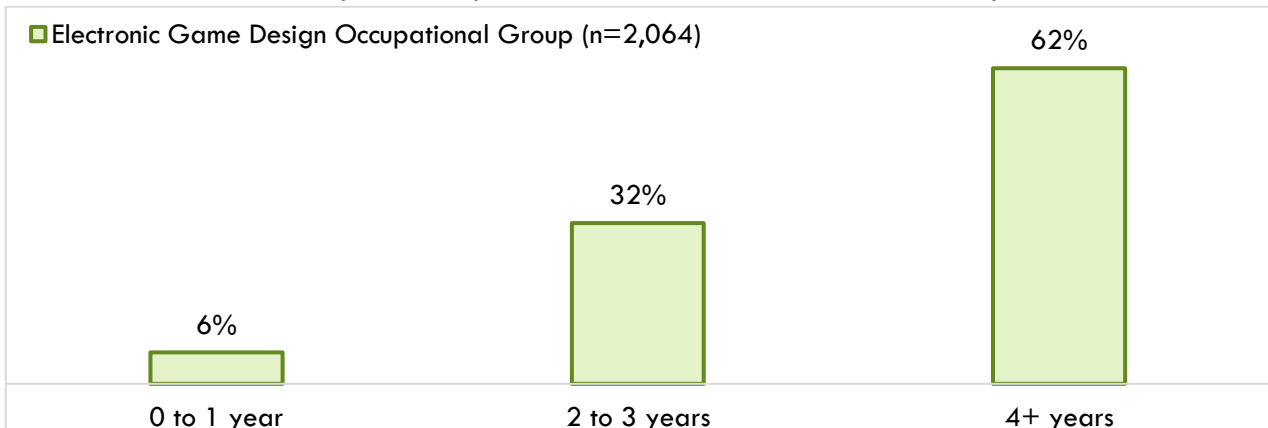
Source: Burning Glass – Labor Insights

Student Completions and Programs Outcomes

Three regional community colleges currently use four program codes for their programs related to electronic game design. Combined, regional community college electronic game design programs have issued 42 awards annually over the last three academic years, 2019-2022. Exhibit 11 displays each regional electronic game design programs and award types students earn upon program completion.

Exhibit 11: Electronic game design-related programs, Inland Empire/Desert Region, 2022-23 academic year

College	TOP Program (TOP Code)	Local Program Title	Award
Chaffey College	Computer Programming (0707.10)	Computer Game Development	Certificate
Moreno Valley College	Multimedia (0614.10)	Simulation and Gaming: Game Art	Associate Degree/Certificate
Norco College	Digital Media (0614.00)	3D Game Modeling and Animation	Associate Degree/Certificate
		Game Concept Art	Associate Degree/Certificate
		Game Development Core	Associate Degree/Certificate
	Electronic Game Design (0614.20)	Game Design	Associate Degree/Certificate
	Computer Programming (0707.10)	Game Programming	Associate Degree/Certificate

Source: COCI, 2022-23 Community College Catalogs

Digital Media (0614.00): A broad range of programs that combine computer and other electronic technologies with skills and techniques from various fine arts and communications disciplines (Taxonomy of Programs, 2012).

Multimedia (0614.10): Principles and techniques of using computers to bring together text, sounds, animation, graphic art, and video to create interactive products to inform, educate, or entertain (Taxonomy of Programs, 2012).

Electronic Game Design (0614.20): N/A.

Computer Programming (0707.10): Entry-level programming, including methods, procedures, symbols and rules used in planning and writing instructions in computer language for the solution of a problem. Includes programming for the World Wide Web (Taxonomy of Programs, 2012).

Exhibits 12 – 15 display student completions for computer programming (0707.10), digital media (0614.00), electronic game design (0614.20), and multimedia (0614.10) programs related to electronic game design. It should be noted that the awards data displayed in this report are specific to electronic game design programs and do not display all awards under these program codes. Norco College and Chaffey College offer electronic game design-related programs and general computer programming programs that use the same computer programming (0707.10) program code. Since these awards for these programs are spread across programs that use the same TOP, awards from these programs could not be obtained.

Over the previous three academic years, Norco College issued 15 awards annually in game development-focused digital media programs and 25 awards annually in electronic game design programs. Moreno Valley College has issued two awards annually in its multimedia program related to electronic game design over the last three academic years. Program completion and student outcome methodologies can be found in the appendix.

Exhibit 12: Annual average community college awards for digital media programs related to electronic game design, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0614.00 – Digital Media (Local Program Title)	Academic Year 2019-20	Academic Year 2020-21	Academic Year 2021-22	Total CC Annual Average Awards, Academic Years 2019-22
Norco College (Game Development Core, Game Concept Art, 3D Game Modeling and Animation)				**15**
Associate Degree	0	4	14	6
Certificate 16 < 30 semester units	0	5	21	9
Total	**0**	**9**	**35**	**15**

Source: MIS Data Mart, COCI

Exhibit 13: Annual average community college awards for multimedia programs related to electronic game design, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0614.10 - Multimedia (Local Program Title)	Academic Year 2019-20	Academic Year 2020-21	Academic Year 2021-22	Total CC Annual Average Awards, Academic Years 2019-22
Moreno Valley College (Simulation and Gaming: Game Art)				**2**
Associate Degree	5	0	0	2
Certificate 30 < 60 semester units	2	0	0	1
Total	**7**	**0**	**0**	**2**

Source: MIS Data Mart, COCI

Exhibit 14: Annual average community college awards for electronic game design programs, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0614.20 – Electronic Game Design (Local Program Title)	Academic Year 2019-20	Academic Year 2020-21	Academic Year 2021-22	Total CC Annual Average Awards, Academic Years 2019-22
Norco College (Game Design)				**25**
Associate Degree	13	8	13	11
Certificate 30 < 60 semester units	14	11	15	13
Total	**27**	**19**	**28**	**25**

Source: MIS Data Mart, COCI

Exhibit 15: Annual average community college awards for computer programming programs related to electronic game design, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0707.10 – Computer Programming (Local Program Title)	Academic Year 2019-20	Academic Year 2020-21	Academic Year 2021-22	Total CC Annual Average Awards, Academic Years 2019-22
Chaffey College (Computer Game Development)				**0**
Certificate 8 < 16 semester units	0	0	0	0
Norco College (Game Programming)				**0**
Associate Degree	0	0	0	0
Certificate 16 < 30 semester units	0	0	0	0
Total	**0**	**0**	**0**	**0**

Source: MIS Data Mart, COCI

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibits 16 – 19.

Exhibit 16: 0614.00 – Digital media strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0614.00 – Digital Media	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	1,044	9,238
Completed 9+ career education units in one year (2020-21)	28%	31%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	33%	78%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	30	284
Transferred to a four-year institution (transfers)	33	665
Job closely related to the field of study (2018-19)	61%	51%

Strong Workforce Program Metrics: 0614.00 – Digital Media	Inland Empire/Desert Region	California
Median annual earnings (all exiters)	$23,202	$28,148
Median change in earnings (all exiters)	54%	25%
Attained a living wage (completers and skills-builders)	39%	31%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Exhibit 17: 0614.10 – Multimedia strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0614.10 – Multimedia	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	109	4,443
Completed 9+ career education units in one year (2020-21)	37%	29%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	-	73%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	-	213
Transferred to a four-year institution (transfers)	-	310
Job closely related to the field of study (2018-19)	-	57%
Median annual earnings (all exiters)	$33,600	$33,112
Median change in earnings (all exiters)	-	46%
Attained a living wage (completers and skills-builders)	-	37%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Exhibit 18: 0614.20 – Electronic game design strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0614.20 – Electronic Game Design	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	500	1,918
Completed 9+ career education units in one year (2020-21)	31%	32%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	-	69%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	-	38
Transferred to a four-year institution (transfers)	34	100
Job closely related to the field of study (2018-19)	0%	42%
Median annual earnings (all exiters)	$27,860	$24,800
Median change in earnings (all exiters)	25%	35%
Attained a living wage (completers and skills-builders)	47%	31%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Exhibit 19: 0707.10 – Computer programming strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0707.10 – Computer Programming	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	2,514	39,212
Completed 9+ career education units in one year (2020-21)	28%	24%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	84%	76%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	48	745
Transferred to a four-year institution (transfers)	282	4,166
Job closely related to the field of study (2018-19)	56%	67%
Median annual earnings (all exiters)	$33,252	$41,032
Median change in earnings (all exiters)	28%	22%
Attained a living wage (completers and skills-builders)	58%	53%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Other postsecondary institutions may utilize the game and interactive media design CIP code (50.0411) for their electronic game design programs. However, over the last three academic years, no other regional postsecondary education institution issued awards using this program code. The following is the program description for game and interactive media design CIP programs.

A program that focuses on the design, development, and programming of interactive media entertainment, including computer and video games, virtual environments, Internet applications, and other interactive media. Includes instruction in the theory of games, turn-based games, real-time games, visual and interactive design, story development, animation, simulation, and programming (IPEDS, 2023).

Summary of Findings

Community college electronic game design programs (0614.20) provide the knowledge, skills, and abilities that prepare students for employment in three bachelor's degree-level occupations and one community college-level occupation. The community college-level electronic game design occupation is expected to have 45 annual job openings through 2026, increasing employment by 20%. The median hourly earnings for web and digital interface designers are above the living wage ($21.82 per hour), indicating that approximately 50% of workers earn a living wage.

Regional community colleges have issued 42 awards annually in programs related to electronic game design. No other known regional postsecondary educational institutions issued awards related to electronic game design training over the last three academic years.

The COE recommends expanding electronic game design programs to meet the regional demand for community college-level electronic game design workers. Colleges considering electronic game design programs should meet with relevant employers to ensure that students are equipped with the requisite skills to earn a living wage shortly after exiting a program.

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March 2023

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Appendix: Occupation definitions, sample job titles, five-year projections, and earnings for electronic game design occupations

Occupation Definitions (SOC code), Education and Training Requirements, Community College Education Attainment

Computer Programmers (15-1251)

Create, modify, and test the code and scripts that allow computer applications to run. Work from specifications drawn up by software and web developers or other individuals. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.

Sample job titles: Analyst Programmer, Application Programmer Analyst, Computer Programmer, Computer Programmer Analyst, Internet Programmer, Java Developer, Programmer, Programmer Analyst, Web Applications Programmer, Web Programmer

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Work Experience: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 20%

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.

Sample job titles: Application Developer, Application Integration Engineer, Developer, Infrastructure Engineer, Network Engineer, Software Architect, Software Developer, Software Development Engineer, Software Engineer, Systems Engineer

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Work Experience: None
Incumbent workers with a Community College Award 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.

Sample job titles: Technology Applications Engineer, Web Architect, Web Design Specialist, Web Designer, Web Developer, Webmaster

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Work Experience: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 24%

Video Game Designers (15-1255.01)

Design core features of video games. Specify innovative game and role-play mechanics, story lines, and character biographies. Create and maintain design documentation. Guide and collaborate with production staff to produce games as designed.

Sample job titles: Design Director, Designer, Environmental Artist, Game Design Consultant, Game Designer, Gamemaster, Level Designer, World Designer

Special Effects Artists and Animators (27-1014)

Create special effects or animations using film, video, computers, or other electronic tools and media for use in products, such as computer games, movies, music videos, and commercials.

Sample job titles: 3D Animator (Three-Dimensional Animator), 3D Artist (Three-Dimensional Artist), Animator, Artist, Digital Artist, Graphic Artist, Illustrator, Motion Graphics Artist, Multimedia Producer

Entry-Level Educational Requirement: Postsecondary nondegree award
Training Requirement: None
Work Experience: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 27%

Appendix: Methodology

Exhibits 12 – 15 display the average annual California Community College (CCC) awards conferred during the three academic years between 2019 and 2022 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total of associate degrees and certificates issued during the timeframe, divided by three to calculate an annual average. This is done to minimize the effect of atypical variations that might be present in a single year.

Community college student outcome information is from LaunchBoard and is based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database records. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2023a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS), administered by Santa Rosa Junior College (LaunchBoard, 2023a).

Job ad data is limited to the information provided by employers and the ability of artificial intelligence search engines to identify this information. Additionally, preliminary calculations by Georgetown Center on Education and the Workforce found that "just 30 to 40 percent of openings for candidates with some college or an associate degree, and only 40 to 60 percent of openings for high school diploma holders appear online" (Carnevale et al., 2014). Online job ads often do not reveal employers' hiring intentions; it is unknown if employers plan to hire one or multiple workers from a single online job ad or collect resumes for future hiring needs. A closed job ad may not be the result of a hired worker.

Table 1. 2021 to 2026 job growth, wages, entry-level education, training, and work experience required for the electronic game design occupational group in the Inland Empire/Desert Region (Riverside and San Bernardino Counties combined)

Occupation (SOC)	2021 Jobs	5-Year Change	5-Year % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage (10th to 90th percentile)	Median Hourly Wage (50th percentile)	Average Annual Earnings	Entry-Level Education & On-The-Job-Training	Work Experience Required
Bachelor's Degree-level									
Software Developers (15-1252)	3,370	776	23%	400	$30.49 to $80.99	$50.07	$113,800	Bachelor's degree & None	None
Computer Programmers (15-1251)	626	20	3%	48	$23.09 to $59.35	$45.56	$88,700	Bachelor's degree & None	None
Special Effects Artists and Animators (27-1014)	161	13	8%	21	$23.23 to $60.59	$38.51	$89,300	Bachelor's degree & None	None
Bachelor's Degree-level Total	**4,156**	**809**	**19%**	**469**	-	-	-	-	-
Community College-level									
Web and Digital Interface Designers (15-1255)	344	68	20%	45	$15.50 to $60.18	$25.15	$67,300	Bachelor's degree & None	None
Community College-level Total	**344**	**68**	**20%**	**45**	-	-	-	-	-
Total	**4,500**	**878**	**19%**	**513**	-	-	-	-	-

Source: Lightcast 2023.1