

Labor Market Analysis: 0614.20/Electronic Game Design

Essentials of Video Game Programming

Certificate requiring 16 to fewer than 30 semester units

Los Angeles Center of Excellence, August 2023

Summary

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Education:	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Emerging Occupation(s)			
	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>

The Los Angeles Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to three middle-skill occupations:

- **Web Developers (15-1254)** Develop and implement websites, web applications, application databases, and interactive web interfaces. Evaluate code to ensure that it is properly structured, meets industry standards, and is compatible with browsers and devices. Optimize website performance, scalability, and server-side code and processes. May develop website infrastructure and integrate websites with other computer applications;¹
- **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;²
- **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;³

¹ [Web Developers \(bls.gov\)](https://www.bls.gov/oes/current/oes151254.htm)

² [Web and Digital Interface Designers \(bls.gov\)](https://www.bls.gov/oes/current/oes151255.htm)

³ [Special Effects Artists and Animators \(bls.gov\)](https://www.bls.gov/oes/current/oes271014.htm)

and one emerging occupation:

- **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.⁴

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.⁵ Although the occupations in this report typically require a bachelor's degree, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these occupations related to game and character design in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and approximately one-third of current workers in the field have completed some college/associate degree or less education. **Therefore, due to all the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

Demand:

- **Supply Gap Criteria** – Over the next five years, **3,376 jobs are projected to be available annually** in the region due to new job growth and replacements, **which is more than the three-year average of 817 awards conferred** by educational institutions in the region.
 - However, the SOC codes in this report include a variety of digital media occupations, including game and character design jobs. Since the SOC code does not solely represent game and character design, **the number of annual job openings is likely overstated.**
 - Over the past 12 months, there were **6,753 online job postings related to these digital media occupations.** The highest number of job postings were for front end developers, web developers, UI/UX designers, front end engineers, and back end engineers.
- **Living Wage Criteria** – Within Los Angeles County, all three occupations have **entry-level wages above the self-sufficiency standard hourly wage** (\$18.10/hour).⁶

⁴ [15-1255.01 - Video Game Designers \(onetonline.org\)](https://onetonline.org)

⁵ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

⁶ Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

- **Educational Criteria** –The Bureau of Labor Statistics (BLS) lists a **bachelor’s degree** as the **typical entry-level education** for all three occupations in this report.
 - However, the national-level educational attainment data indicates **between 30% and 41% of workers in the field have completed some college/associate degree or less education.**

Supply:

- There are **23 community colleges** in the greater LA/OC region that issue awards related to digital media and game design, conferring an average of **308 awards annually** between 2019 and 2022.
- Between 2019 and 2021, there was an average of **509 awards conferred annually** in related training programs by non-community college institutions throughout the greater LA/OC region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these occupations related to game and character design. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 12% through 2026. There will be nearly 3,400 job openings per year through 2027 due to job growth and replacements. It is important to note that the SOC codes in this report include a variety of digital media occupations and not solely game and character design jobs. Therefore, the data in Exhibit 1 is likely overstated.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties⁷

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	23,220	26,072	2,852	12%	2,932
Orange	4,243	4,564	321	8%	444
Total	27,464	30,637	3,173	12%	3,376

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these occupations related to game and character design in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County

All three occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$25.09 and \$37.00, while experienced workers can expect to earn wages between \$56.58 and \$76.99.

⁷ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Exhibit 2: Earnings for Occupations in LA County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Web Developers (15-1254)	\$25.09	\$40.31	\$56.58	\$83,900
Web and Digital Interface Designers (15-1255)	\$26.54	\$35.68	\$57.88	\$74,200
Special Effects Artists and Animators (27-1014)	\$37.00	\$59.23	\$76.99	\$123,200

*rounded to the nearest \$100

Orange County

All three occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$25.00 and \$27.47, while experienced workers can expect to earn wages between \$54.27 and \$68.01.

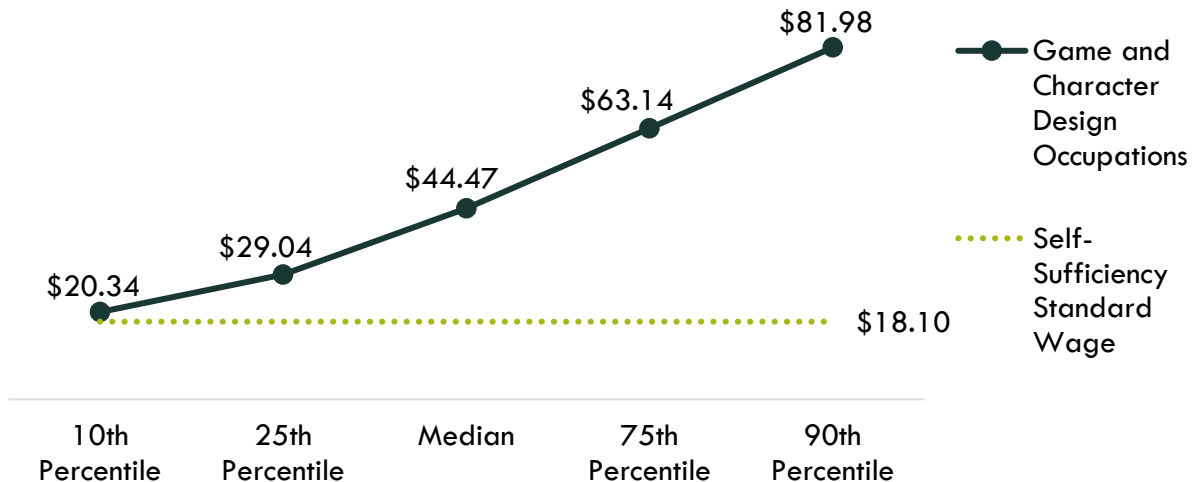
Exhibit 3: Earnings for Occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Web Developers (15-1254)	\$23.61	\$38.31	\$54.27	\$79,700
Web and Digital Interface Designers (15-1255)	\$25.00	\$33.93	\$54.97	\$70,600
Special Effects Artists and Animators (27-1014)	\$27.47	\$47.21	\$68.01	\$98,200

*rounded to the nearest \$100

On average, the entry-level earnings for the occupations in this report are \$29.04; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

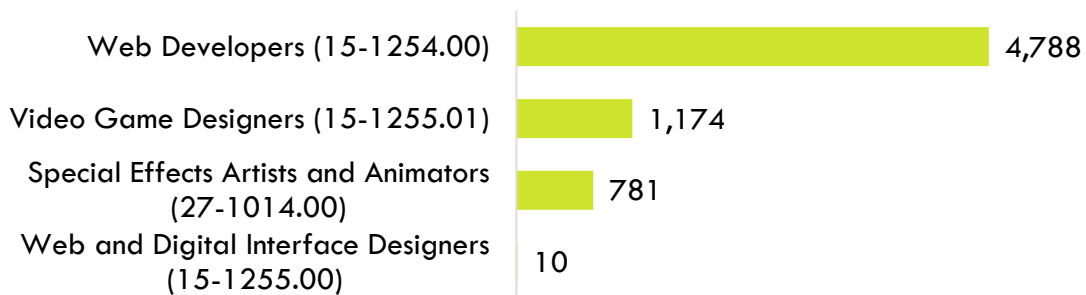
Exhibit 4: Average Hourly Earnings for Game and Character Design Occupations in LA/OC



Job Postings

There were 6,753 online job postings related to game and character design listed in the past 12 months. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (71%) were for *web developers* (4,788), followed by *video game designers* (17%) and *special effects artists and animators* (12%). The highest number of job postings were for front end developers, web developers, UI/UX designers, front end engineers, and back end engineers. The top skills were JavaScript (programming language), Cascading Style Sheets (CSS), user experience (UX), front end (software engineering), and HyperText Markup Language (HTML). The top three employers, by number of job postings, in the region were all staffing companies CyberCoders, Virtual Vocations, and Motion Recruitment. Traditional employers rounding out the list were Riot Games, Disney, Electronic Arts, Amazon, Activision/Blizzard, and Apple.

Exhibit 5: Job postings by occupation (last 12 months)



Educational Attainment

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for all three occupations in this report. However, the national-level educational attainment data indicates between 30% and 41% of workers in the field have completed some college/associate degree or less education. Of the 43% of game and character design job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 5% (157) requested high school or vocational training, 2% (69) requested an associate degree, and 92% (2,647) requested a bachelor's degree.

Educational Supply

Community College Supply

Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are: Santa Monica, Mt. San Antonio, and LA Mission.

Exhibit 6: Regional community college awards (certificates and degrees), 2019-2022

TOP	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
0614.00	Digital Media	Glendale	1	-	-	0
		LA Mission	4	5	5	5
		LA Trade-Tech	11	18	12	14

TOP	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
		Pasadena	-	3	15	6
		Rio Hondo	2	1	1	1
		Santa Monica	-	-	19	6
		LA Subtotal	18	27	52	32
		Coastline	-	3	3	2
		Cypress	-	2	7	3
		Golden West	10	7	-	6
		Irvine	1	6	3	3
		Saddleback	-	1	1	1
		Santa Ana	1	6	34	14
		OC Subtotal	12	25	48	28
		Supply Subtotal/Average	30	52	100	61
0614.10	Multimedia	East LA	2	-	-	1
		Glendale	-	-	4	1
		LA Mission	18	23	28	23
		Pasadena	1	-	-	0
		Santa Monica	5	9	-	5
		LA Subtotal	26	32	32	30
		Cypress	1	1	3	2
		Orange Coast	2	4	8	5
		Santiago Canyon	3	4	-	2
		OC Subtotal	6	9	11	9
		Supply Subtotal/Average	32	41	43	39
0614.20	Electronic Game Design	Pasadena	1	1	5	2
		LA Subtotal	1	1	5	2
		Golden West	2	-	-	1
		OC Subtotal	2	-	-	1
		Supply Subtotal/Average	3	1	5	3
0614.30	Website Design and Development	Citrus	-	-	1	0
		LA Pierce	2	4	5	4
		Mt San Antonio	7	6	1	5
		Pasadena	1	1	7	3
		Santa Monica	2	3	2	2
		West LA	-	-	3	1
		LA Subtotal	12	14	19	15

TOP	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
		Coastline	1	1	-	1
		Fullerton	-	1	2	1
		Irvine	-	5	4	3
		Orange Coast	9	7	13	10
		Saddleback	2	7	4	4
		Santa Ana	2	1	-	1
		Santiago Canyon	3	6	5	5
		OC Subtotal	17	28	28	24
		Supply Subtotal/Average	29	42	47	39
0614.40	Animation	Cerritos	13	4	7	8
		East LA	12	12	17	14
		El Camino	5	4	4	4
		Glendale	6	2	6	5
		LA City	-	1	2	1
		LA Mission	11	5	11	9
		Mt San Antonio	58	43	26	42
		Pasadena	1	6	12	6
		Rio Hondo	9	9	10	9
		Santa Monica	19	69	103	64
		LA Subtotal	134	155	198	162
		Coastline	-	1	1	1
		Cypress	1	-	-	0
		Fullerton	1	-	-	0
		Irvine	1	3	2	2
		Orange Coast	1	-	-	0
		OC Subtotal	4	4	3	4
		Supply Subtotal/Average	138	159	201	166
		Supply Total/Average	232	295	396	308

Non-Community College Supply

For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for game and character design occupations. Exhibit 7 shows the annual and three-year average number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2019 to 2021. Between 2019 and 2021, non-community college institutions in the region conferred an average of 509 bachelor's and sub-

baccalaureate awards. Bachelor's awards are included since the occupations in this report require a bachelor's degree. Sub-baccalaureate awards include associate degrees, postsecondary awards, and other academic awards that typically take fewer than four years to complete.

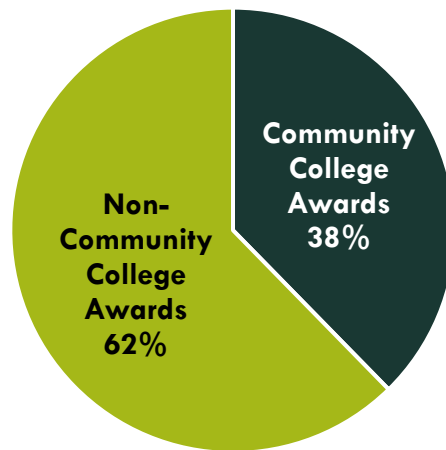
Exhibit 7: Regional non-community college awards, 2019-2021

CIP	Program	Institution	2019-20 Awards	2020-21 Awards	2-Year Average
09.0702	Digital Communication and Media/Multimedia	CSU-Dominguez Hills	41	57	49
		Columbia College Hollywood	-	28	14
		Fremont College	1	-	1
		Marymount California University	10	9	10
		Vanguard University of Southern California	2	1	2
10.0304	Animation, Interactive Technology, Video Graphics, and Special Effects	ABC Adult School	-	1	1
		Art Center College of Design	36	41	39
		California Institute of the Arts	39	37	38
		Chapman University	20	22	21
		Columbia College Hollywood	-	11	6
		Gnomon	66	-	33
		Laguna College of Art and Design	33	25	29
		Los Angeles Film School	47	35	41
		Loyola Marymount University	21	26	24
New York Film Academy	24	10	17		
11.0801	Web Page, Digital/Multimedia and Information Resources Design	Los Angeles Pacific College	-	4	2
50.0102	Digital Arts	Columbia College Hollywood	-	15	8
		Gnomon	-	31	16
		Los Angeles Academy of Figurative Art	4	-	2
		Los Angeles Pacific College	4	2	3

CIP	Program	Institution	2019-20 Awards	2020-21 Awards	2-Year Average
		Marymount California University	3	2	3
		Otis College of Art and Design	48	52	50
		USC	15	37	26
		Woodbury University	2	-	1
50.0411	Game and Interactive Media Design	Laguna College of Art and Design	34	44	39
		New York Film Academy	7	6	7
		USC	28	24	26
		Woodbury University	6	7	7
Supply Total/Average			491	527	509

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. One of three awards conferred in these programs are awarded by community colleges in the LA/OC region.

Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average



Appendix A: Occupational demand and wage data by county

Exhibit 9. Los Angeles County

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Web Developers (15-1254)	2,971	3,307	336	11%	299	\$25.09	\$40.31	\$56.58
Web and Digital Interface Designers (15-1255)	5,492	6,113	621	11%	604	\$26.54	\$35.68	\$57.88
Special Effects Artists and Animators (27-1014)	14,757	16,651	1,895	13%	2,029	\$37.00	\$59.23	\$76.99
Total	23,220	26,072	2,852	12%	2,932	-	-	-

Exhibit 10. Orange County

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Web Developers (15-1254)	1,151	1,266	115	10%	112	\$23.61	\$38.31	\$54.27
Web and Digital Interface Designers (15-1255)	1,940	2,118	178	9%	204	\$25.00	\$33.93	\$54.97
Special Effects Artists and Animators (27-1014)	1,152	1,180	28	2%	128	\$27.47	\$47.21	\$68.01
Total	4,243	4,564	321	8%	444	-	-	-

Exhibit 11. Los Angeles and Orange Counties

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	% Age 55 and older*	Typical Entry-Level Education
Web Developers (15-1254)	4,122	4,574	451	11%	411	11%	Bachelor's degree
Web and Digital Interface Designers (15-1255)	7,432	8,231	799	11%	808	9%	Bachelor's degree
Special Effects Artists and Animators (27-1014)	15,909	17,832	1,923	12%	2,157	25%	Bachelor's degree
Total	27,464	30,637	3,173	12%	3,376	-	-

*The average percentage of workers age 55 and older across all occupations in the greater LA/OC region is 27%. These occupations have a smaller share of older workers, which typically indicates fewer replacements needs to offset the amount of impending retirements.

Appendix B: Sources

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor’s Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women’s Welfare, University of Washington
- Chancellor’s Office Curriculum Inventory (COCI 2.0)

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