

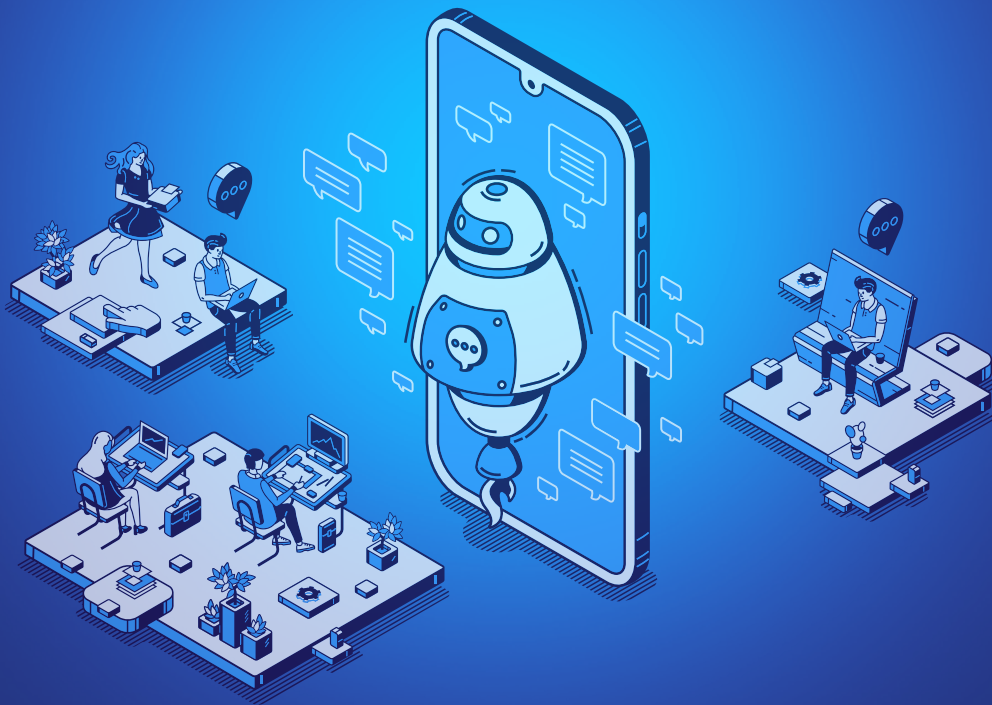
LAEDC

LARC

C·O·E

INFORMATION TECHNOLOGY

REGIONAL PROGRAM
ADVISORY



LOS ANGELES COMMUNITY
COLLEGE PROGRAM LOOK BOOK

MAY 10, 2023
11:00 AM - 1:00 PM

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MEETING AGENDA

Date and Time

May 10, 2023, from 11:00am -1:00pm

Occupation Focus

Information Technology

Opening Remarks

- Welcome and Introductions | Jermaine Hampton, LAEDC
- Los Angeles Regional Consortium Overview | Dr. Narineh Makijan, LARC
- Information Technology Demand Data | Justin Adams, LAEDC
- Human Centered Economic Development | Larry Holt, LAEDC
- Information Technology Supply Data | Luke Meyer, COE

Discussion Topics Moderated by Jermaine Hampton and Jose Pelayo

- Industry workforce trends
 - o What are the top emerging trends in Information Technology that the community colleges should know?
 - o What is the most critical change that community colleges must make to prepare for the future effectively?
 - o Do you see the demand for talent growing, leveling off, or shrinking in our region?
- Technology, AI and Equipment
 - o How has new technology including automation and AI transformed the industry?
 - o What software programs and equipment should community colleges be implementing in their curriculum to ensure their graduates are work ready?
 - o What skills and capabilities are the most critical going forward and offer graduates true competitive advantage?
- Workforce Gaps
 - o What would you like to see community colleges doing that will help prepare students for the next level?
 - o What can you as an employer do to support the community colleges? Are there any additional opportunities to bridge knowledge, talent and certification gaps?
 - o Do you have an upskill need for your current workforce that the community colleges could provide?
- Talent Pipeline
 - o How are you currently working with the community colleges to build equitable talent pipelines?
 - o Do you have any systems or programs in place to ensure you have access to, and are cultivating, a diverse workforce?
 - o In Los Angeles County, what is the pathway to middle-skill jobs in this industry? 2 yr College vs 4 yr College?

**Curriculum Review and
Feedback Poll**

Community College Representation
Feedback Poll

Closing Remarks

Next Steps and Adjournment | Jermaine Hampton, LAEDC

LOS ANGELES COUNTY ECONOMIC DEVELOPMENT CORPORATION

The Los Angeles County Economic Development Corporation, a non-profit organization, champions equitable economic growth across the Los Angeles region.

LAEDC is committed to developing a competitive regional workforce because we know that a robust workforce and our economic growth as a region should not be separated from each other. We bring industry leaders and educational partners together within the economic development process. We want our education infrastructure to train the next generation of the workforce and ensure they receive relevant training and can join the industry of their choice. We know there needs to be an alignment between industry and our educational systems.

Vision

A reimagined Los Angeles regional economy – growing, equitable, sustainable, and resilient – that provides a healthy and high standard of living for all.

Mission

Reinventing our economy to collaboratively advance growth and prosperity for all.



The Los Angeles County Economic Development Corporation (LAEDC) was founded in 1981 as a nonprofit, public-benefit organization to harness the power of private sector in collaboration with L.A. County, to guide economic development and create more widely shared prosperity. LAEDC collaborates with all stakeholders in the region including education, business, and government. Learn more at www.LAEDC.org.



Funded by the California Community Colleges Chancellor's Office under the Strong Workforce Program (SWP) as a Los Angeles Regional Project.



Contact Information



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LOS ANGELES REGIONAL CONSORTIUM

Los Angeles Regional Consortium, as a consortium of LA's 19 community colleges, is working collectively to deliver on a promise that California community colleges are accessible and affordable to all who seek opportunities to realize a better future. LARC serves to coordinate, collaborate, organize, and facilitate interaction in the region to ensure workforce training is provided to all in a way that is accessible, efficient, responsive, data-driven and improves outcomes. We collaborate with K-12 partners, high-road employers, and priority industries to align impactful curriculum and workforce training programs, creating a seamless pathway for college and career readiness.

To learn more please visit www.losangelesrc.org

Mission

Our mission is to bridge the gap between LA's workforce and the employers fueling our cutting-edge economy. This will not only close the supply and demand gap, but also increase economic and social mobility for LA County residents.

Contact Information



Dr. Narineh Makijan, Chair/Assistant Vice President

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CENTER OF EXCELLENCE FOR LABOR MARKET RESEARCH

The Los Angeles Center of Excellence for Labor Market Research (COE) hosted at Mt. San Antonio College represents expertise in labor market analysis with a focus on research design, educational and training program mapping, and identifying skill sets for emerging occupations as well as geospatial analysis. The COE maintains strategic alliances with research organizations whose relationships and technical expertise enhance COE research efforts and with industry associations that assist in validating research findings, ensuring that the most recent industry and labor market conditions are captured. COE studies are used to inform policy discussions, industry-wide legislative efforts, and regional workforce and economic development strategies, as well as guide program and resource development efforts by the California Community Colleges. These reports can be accessed at www.coeccc.net.

Mission

The mission of the center is to research, analyze and present information on regional economic and workforce needs, customized for Community College decision making and curriculum planning.

Contact Information



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INDUSTRY REPRESENTATION

Linda Nguyen, Community Engagement Lead, Microsoft



Linda Nguyen is dedicated to community development, education access and economic equity across the public, nonprofit and private sectors.

At Microsoft Philanthropies, Linda leads digital inclusion and transformation initiatives in underserved communities and underestimated individuals. Prior she developed a portfolio of programs in diverse, low-income communities, public private partnerships, and philanthropic reinvestment commitments in housing, economic development and financial literacy at a corporate foundation. From workforce to anti-recidivism, throughout her career, she activated White House initiatives in distressed urban areas. She was an AmeriCorps member, working on education programming to reduce learning loss for children experiencing homelessness in Colorado. In addition to her work in the United States, she executed research and social enterprise projects with international NGOs in Central America, Tanzania and Vietnam aiming to reduce poverty, promote gender equality in education and economic development, and sustainability, all of which aligned with the United Nations development goals.

Anika-Aduesa Smart, GIS Director, LA Metro



Anika is on a mission to take transit further. For almost two decades, her passion has been the integration of systems, leveraging GIS analysis and optimization of resources. Known for her spirited and engaging determination, she applies technical experience with out-of-the-box thinking to solve challenges. As the first GIS director at LA Metro, she recently created the OneMAP Program, a modern, pragmatic approach that has already begun to change the way the agency meets its business objectives. Her team’s innovative use of GIS across the agency earned a prestigious SAG Award from Esri in 2022. She firmly believes in stakeholder engagement, and sees the geospatial enablement of public transit as a critical goal for the industry’s future.

Outside of work, Anika loves a good game of volleyball, and in her spare time enjoys exploring landforms.

Sidnie Davis, California Lead for Education for Social Impact, Google



Sidnie Davis has worked at Google for a little over a decade, first in Campus Recruiting and Outreach, and then in Technical Education Program and Curriculum Development. She currently serves as the California Lead for Education for Social Impact, managing partnerships that increase access in quality technical education at the K-12, post-secondary, and workforce level. Before Google, Sidnie worked for an educational nonprofit and was a public school teacher in the California Bay Area, completing her student teaching in LAUSD.

Justin Washington, Lead Product Manager, Apple TV+



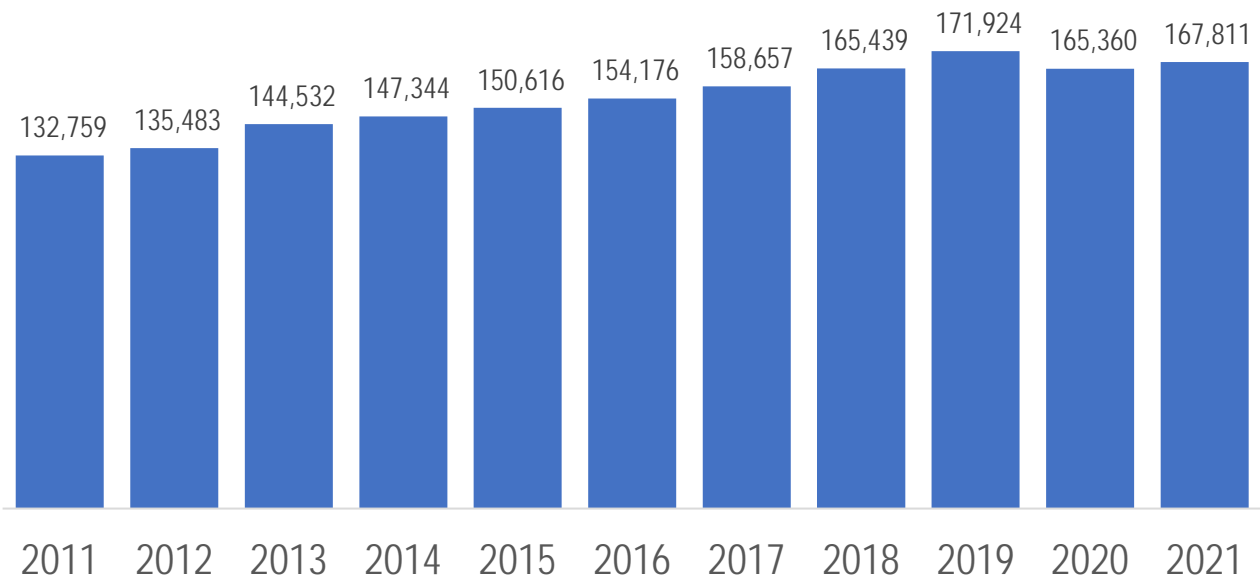
Justin Washington is a creative technologist with 10+ years of product & engineering experience in consumer hardware/software, social, fintech, music & photography. Justin is passionate about the intersection of tech & the liberal arts and crafting things people love.

Justin was born & raised in Detroit, MI, & an alum of the University of Michigan, College of Engineering (Computer Science).

INFORMATION TECHNOLOGY DEMAND DATA

Current Landscape

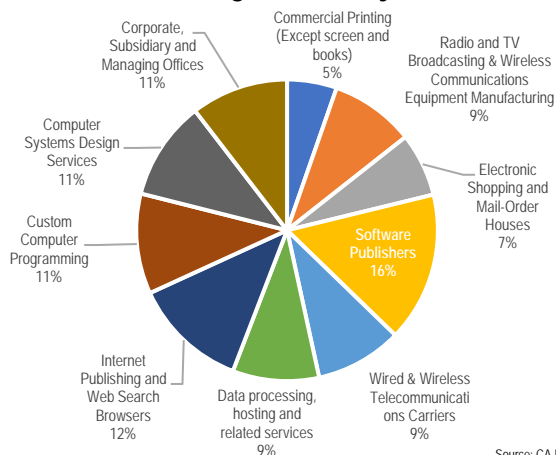
Information and Communications Technology Employment Los Angeles County, 2011 - 2021



Source: CA EDD

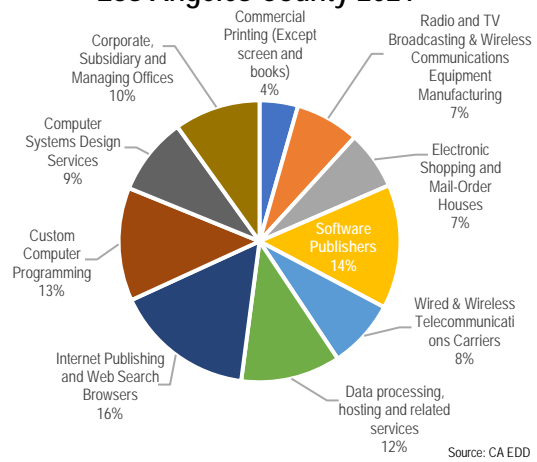
Information and Communications Technology (ICT) employment has seen a general upward trend for the last 10 years, never dipping below the 2011 mark of nearly 133,000 employees. There was a small dip in 2020 but employment continued to grow in 2021.

Employment Distribution for ICT Industries Los Angeles County 2011



Source: CA EDD

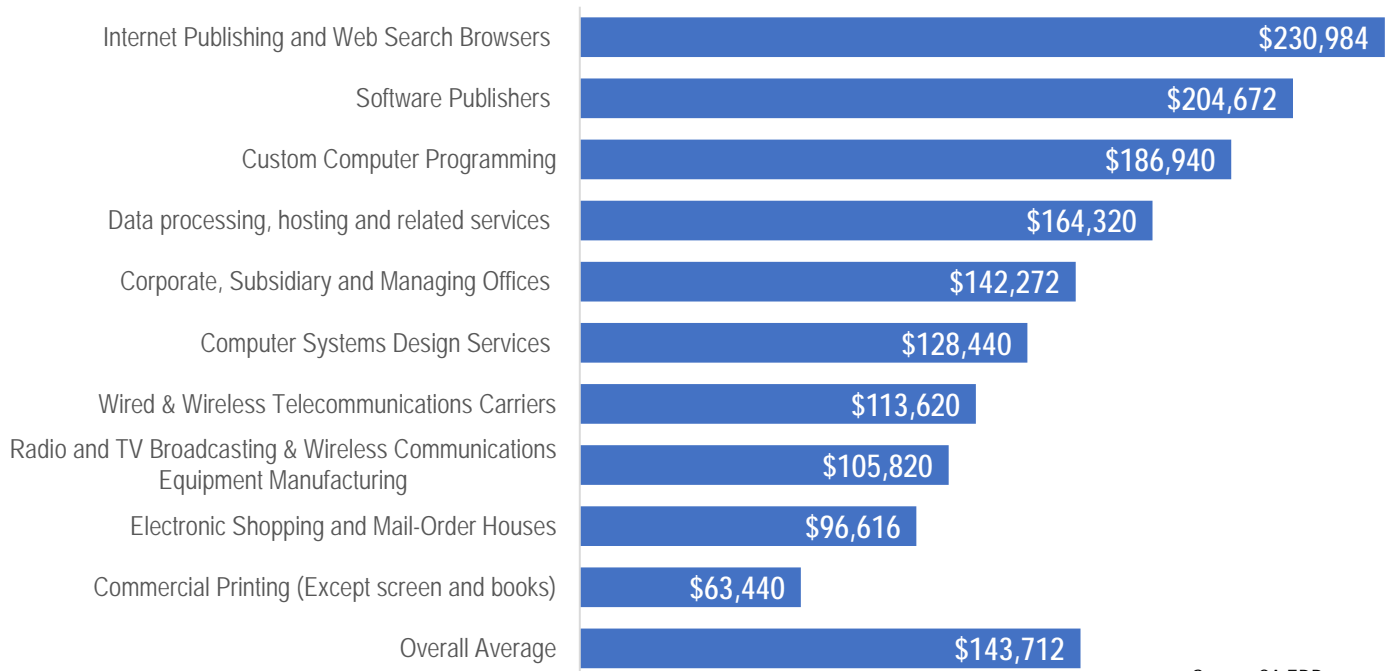
Employment Distribution for ICT Industries Los Angeles County 2021



Source: CA EDD

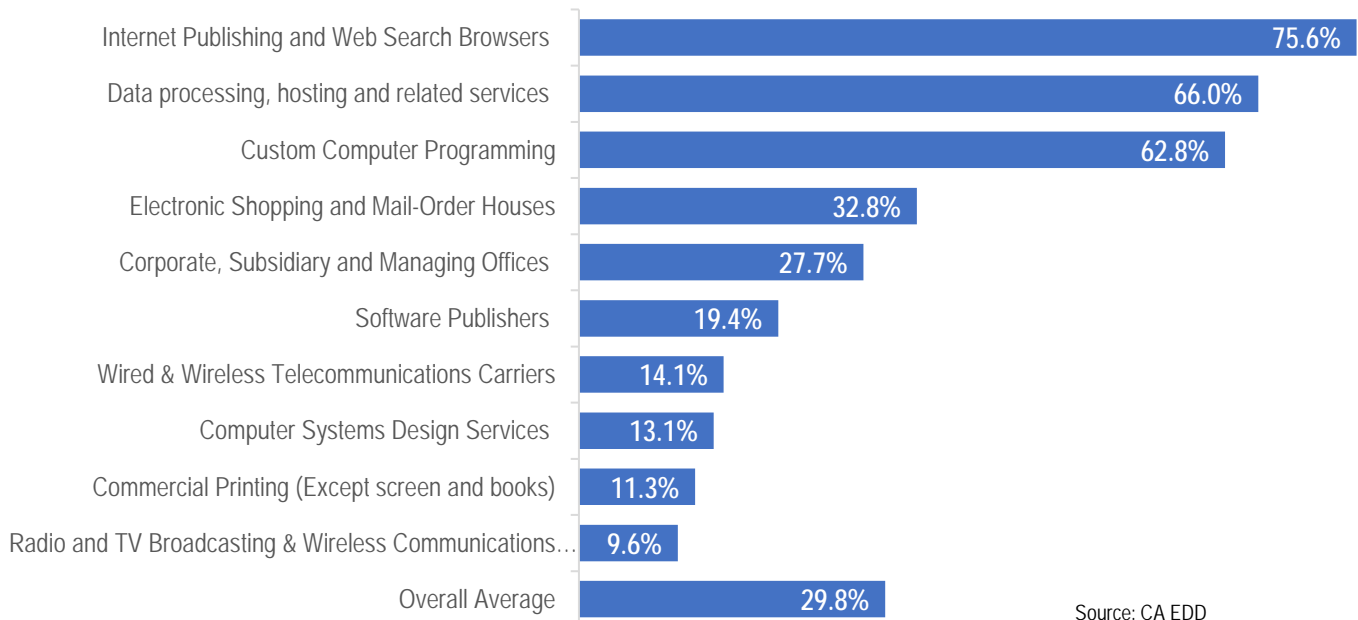
In 2011 the largest industry was Software Publishing, with a 16 percent share of employment. By 2021, the Internet Publishing and Web Search Browsers industry surpassed Software Publishing and held the largest share of employment with 16 percent. All other industries remained stable, growing or contracting by 1 to 3 percent only in this 10-year period.

Average Annual Pay for ICT Industries Los Angeles County 2021



Source: CA EDD

Real Wage Growth in ICT Industries Los Angeles County, 2011 to 2021



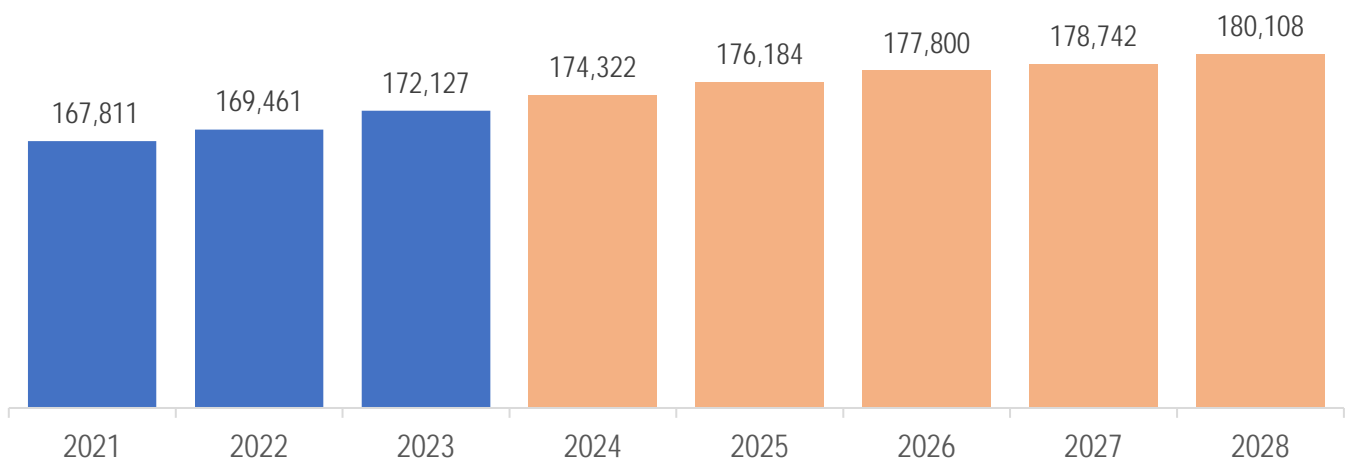
Source: CA EDD

Each industry pays a living wage in Los Angeles County, with the lowest industry paying \$63,440 on average. In May 2021, the average salary in LA County was about \$66,000. Only Commercial Printing has an average salary lower than the county average.

The largest increase occurred in the Internet Publishing and Web Search Browsers industry, with 76 percent growth since 2011. Overall, real wages in the Information and Communications Technology industries grew 30 percent.

Employment Forecast

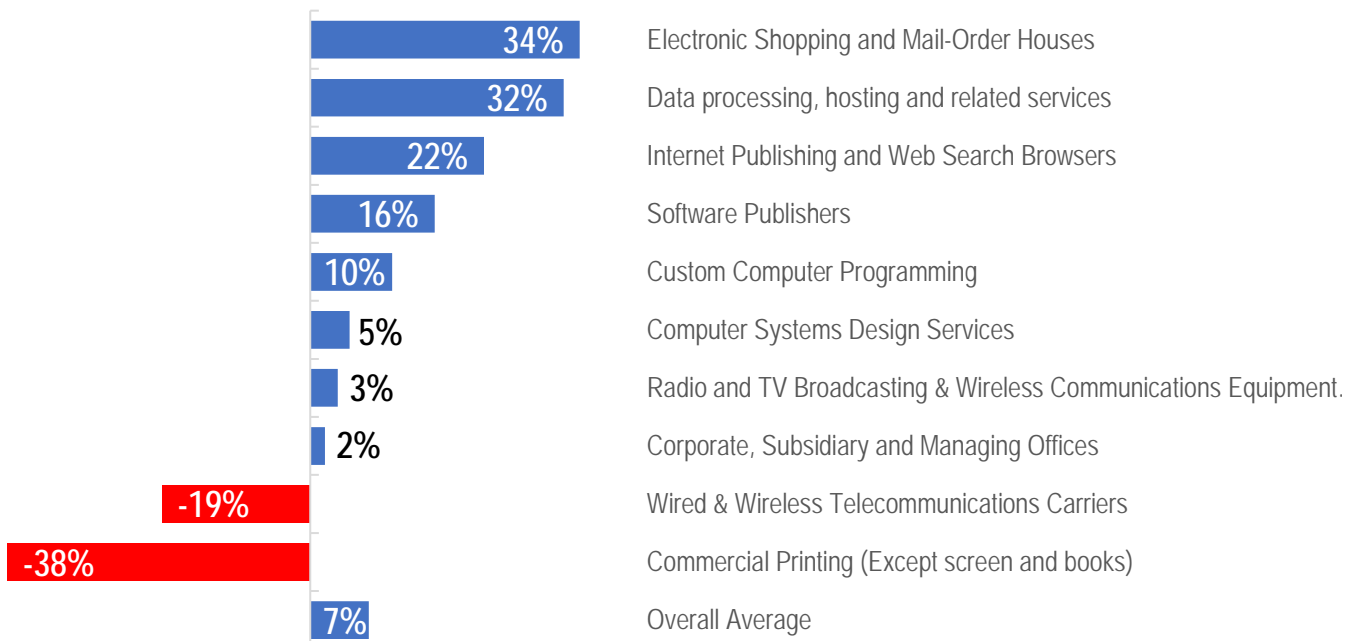
ICT Forecasted Employment Los Angeles County, 2021 - 2028



Source: Lightcast

From 2021 to 2028, employment is expected to grow 7.3 percent, forecasting over 1,750 new jobs per year in Information and Communications Technology industries.

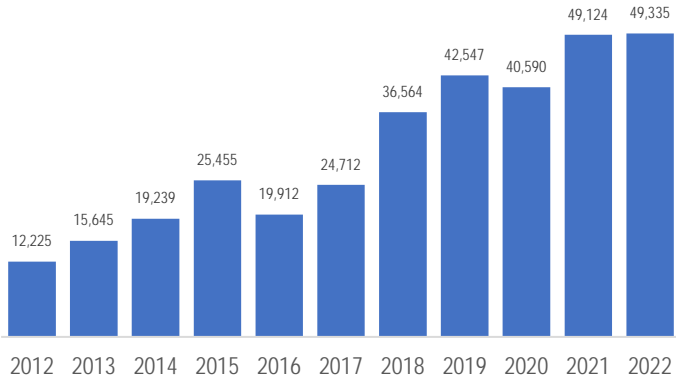
Forecasted Employment Growth in Information and Communications Technology Industries Los Angeles County 2021 - 2028



Information and Communications Technology is anticipated to grow the most in the Electronic Shopping and Mail-Order Houses industry (34 percent), and the Data processing, hosting, and related services industry (32 percent). Overall, ICT industries are expected to grow 7 percent on average through 2028.

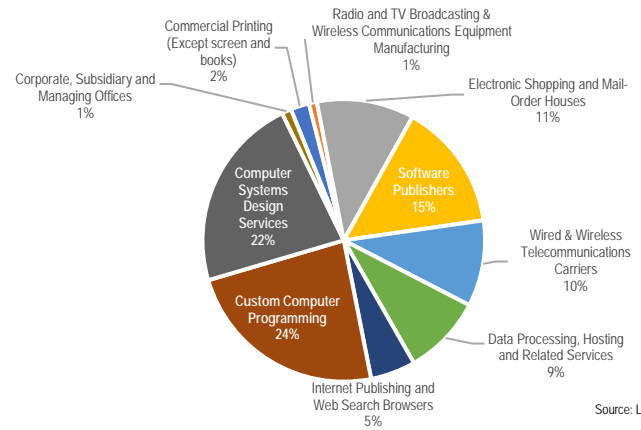
Job Postings

**ICT Job Postings
Los Angeles County 2012 - 2022**



Source: Lightcast

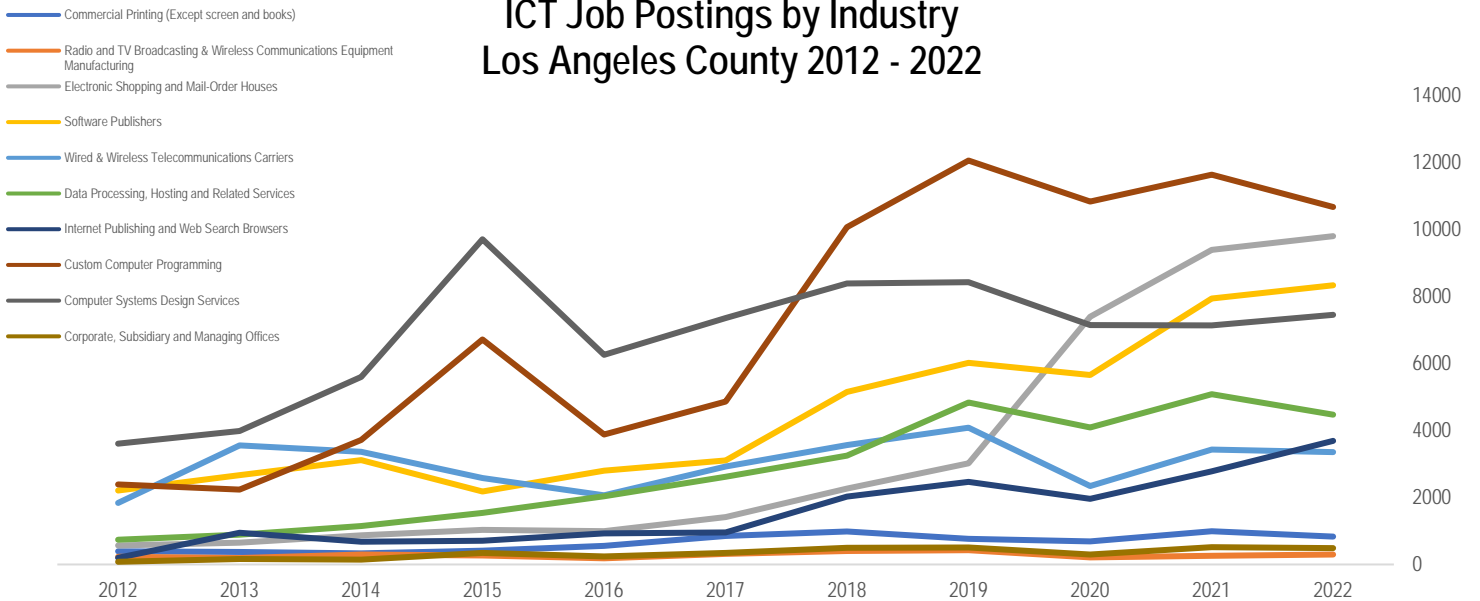
**ICT Job Postings Distribution
Los Angeles County 2012 - 2022**



Source: Lightcast

Job postings peaked in 2022, with over 49,000 job postings compared to about 12,000 in 2012. Custom Computer Programming represents the largest industry over this 10-year period, with 24 percent of total posts.

**ICT Job Postings by Industry
Los Angeles County 2012 - 2022**



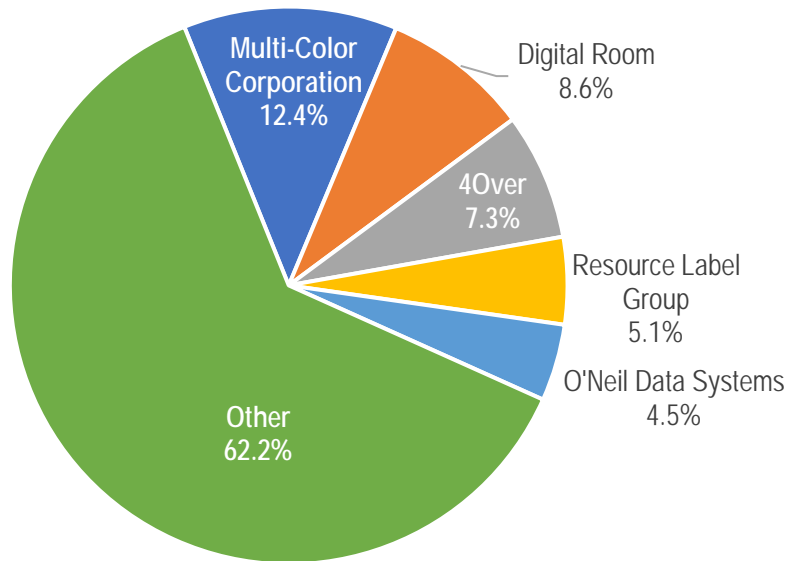
Source: Lightcast

Over the last 4 years Custom Computer Programming, Electronic Shopping and Mail-Order Houses, and Software Publishers have posted for jobs more frequently than all other ICT industries.



Job Postings – Individual Industries

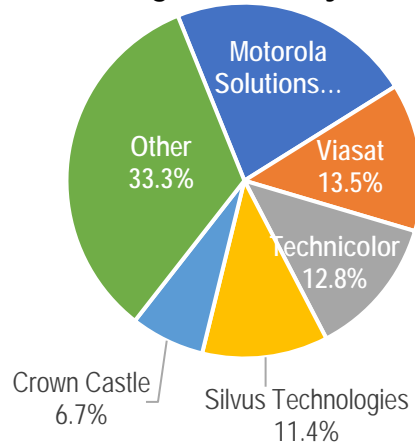
Job Postings for Commercial Printing (Except screen and books) Industry
Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Commercial Printing (Except Screen and Books) industry and their share of job posts in 2022. Strong diversity amongst companies with no concentration in select companies.

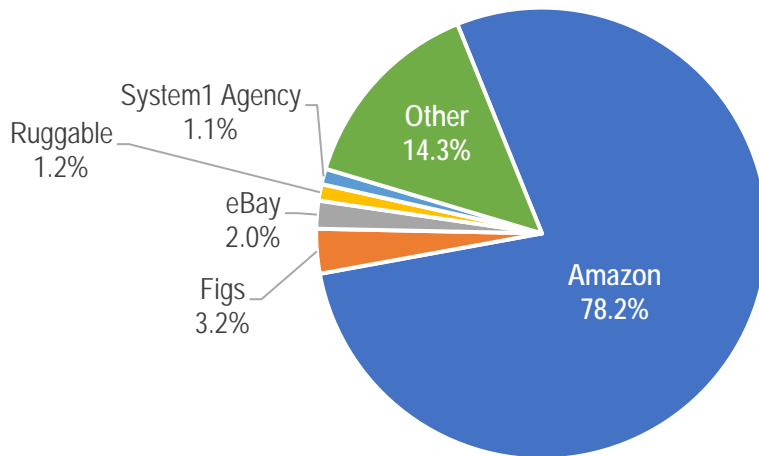
Job Postings for Radio and TV Broadcasting & Wireless Communications Equipment Manufacturing Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Radio and TV Broadcasting & Wireless Communications Equipment Manufacturing industry and their share of job posts in 2022. Two-thirds of job posts in 2022 were made by the top 5 companies in the industry.

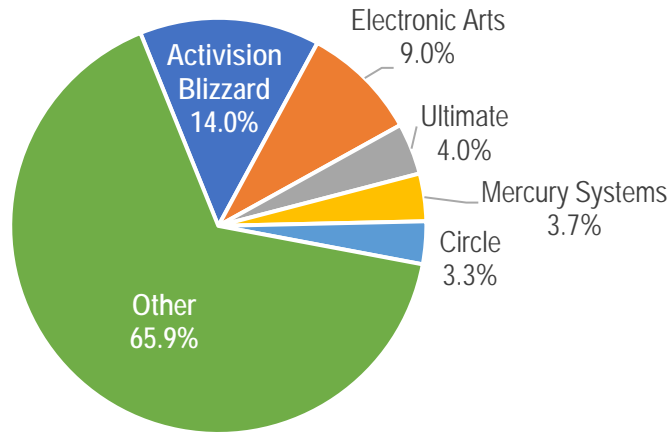
Job Postings for Electronic Shopping and Mail-Order Houses Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Electronic Shopping and Mail-Order Houses industry and their share of job posts in 2022. Amazon was easily the largest employer in 2022, with over 78 percent of job posts in the industry.

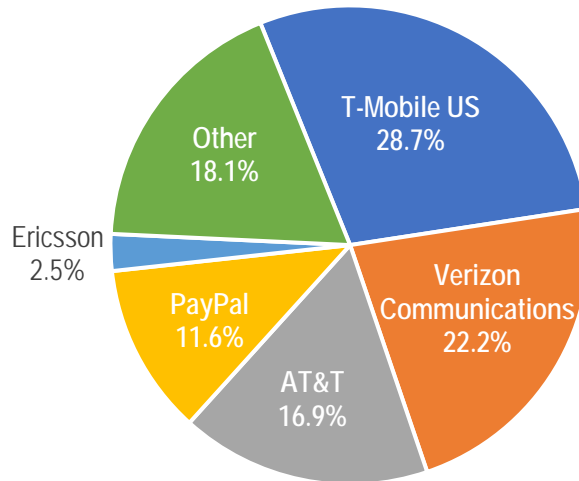
Job Postings for Software Publishers Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Software Publishing industry and their share of job posts in 2022. Despite Activision Blizzard being amongst the top 5 in job postings for all ICT industries in 2022 there is strong diversity of companies posting for job openings, with almost 66 percent job posts coming from outside of the top 5 companies.

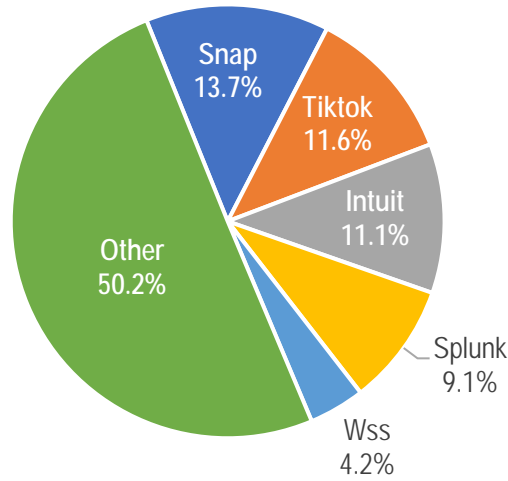
Job Postings for Wired & Wireless Telecommunications Carriers Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Wired and Wireless Telecommunications Carriers industry and their share of job posts in 2022. The Wired and Wireless Telecommunications Carriers industry had a high concentration of their job posts come from the top 4 companies in the industry, accounting for 79.4 percent of all job posts in 2022.

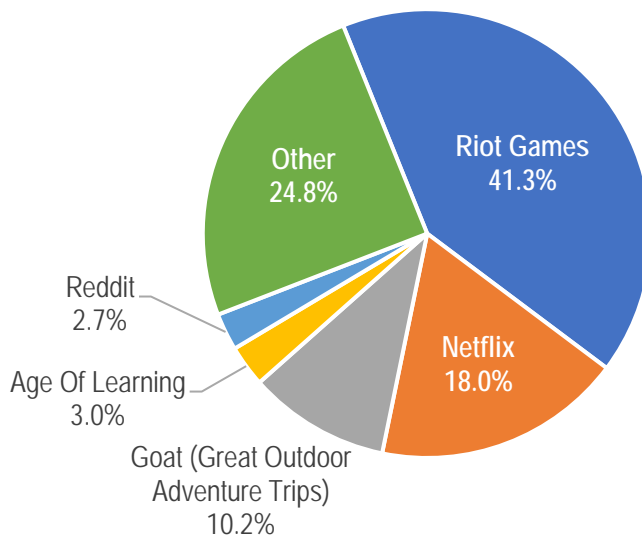
Job Postings for Data Processing, Hosting and Related Services Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Data Processing, Hosting, and Related Services industry and their share of job posts in 2022. There was no strong concentration of job posts within the top 5 companies in the industry, with over 50 percent of posts coming from companies outside the top 5 in 2022.

Job Postings for Internet Publishing and Web Search Browsers Industry Los Angeles County, 2022

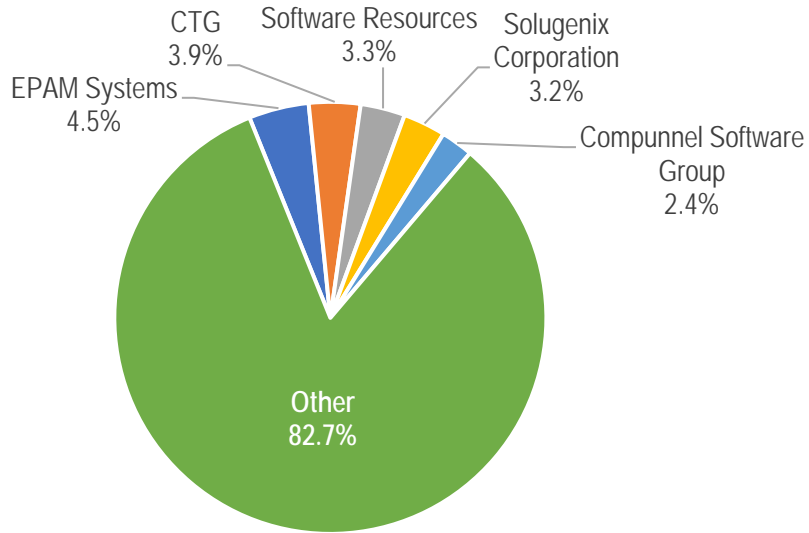


Source: Lightcast

Top 5 companies in the Internet Publishing and Web Search Browsers industry and their share of job posts in 2022. The Internet Publishing and Web Search Browsers industry had a high concentration of

their job posts come from the top 2 companies in the industry, accounting for almost 60 percent of all job posts in 2022, and over 75 percent from the top 5.

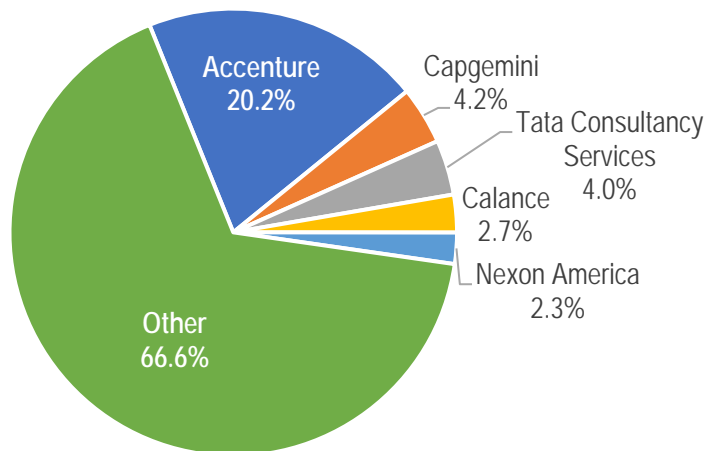
Job Postings for Custom Computer Programming Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Custom Computer Programming industry and their share of job posts in 2022. The Custom Computer Programming industry has the most diversity of companies in their job posts in 2022, with over 80 percent of posts coming from outside of the top 5 companies.

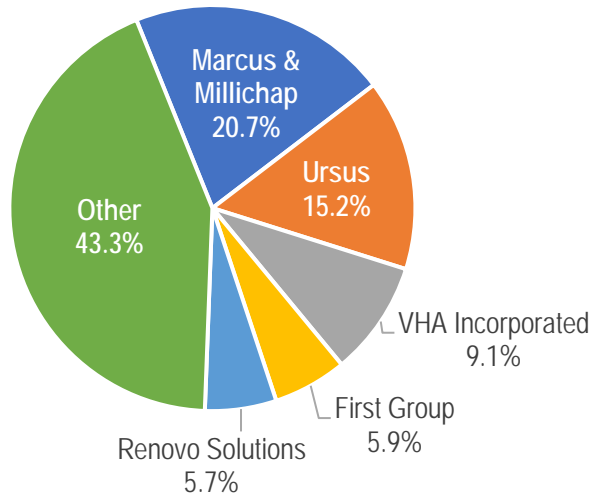
Job Postings for Computer Systems Design Services Industry Los Angeles County, 2022



Source: Lightcast

Top 5 companies in the Computer Systems Design Services industry and their share of job posts in 2022. Despite Accenture being amongst the top 5 in job postings for all ICT industries in 2022 there is strong diversity of companies posting for job openings in the Computer Systems Design Services industry, with two-thirds of job posts coming from outside of the top 5 companies.

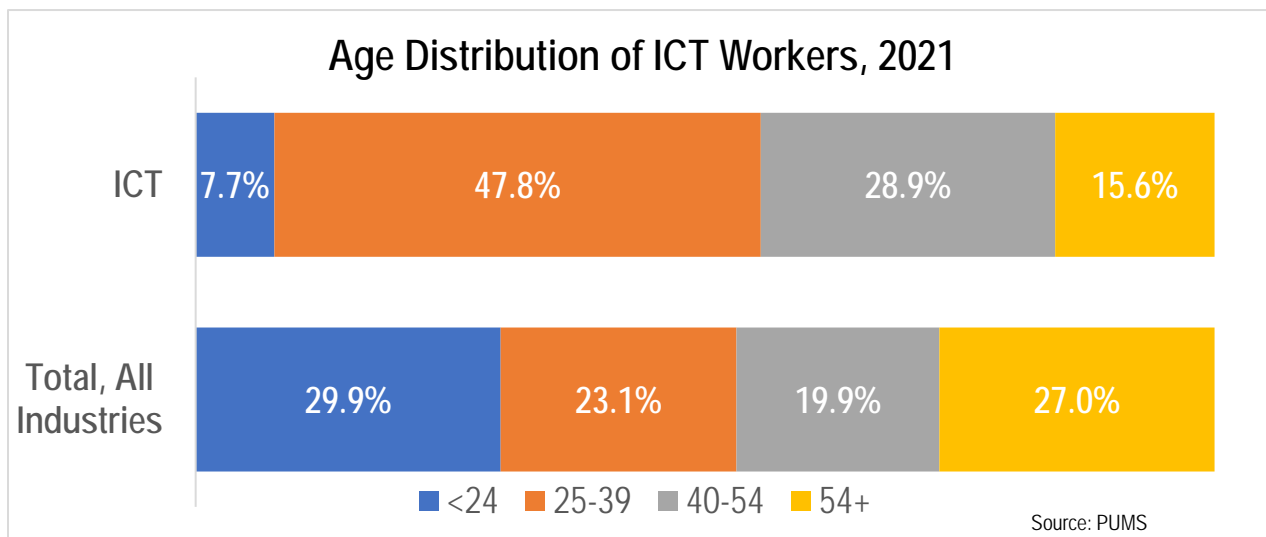
Job Postings for Corporate, Subsidiary and Managing Offices Industry Los Angeles County, 2022



Source: Lightcast

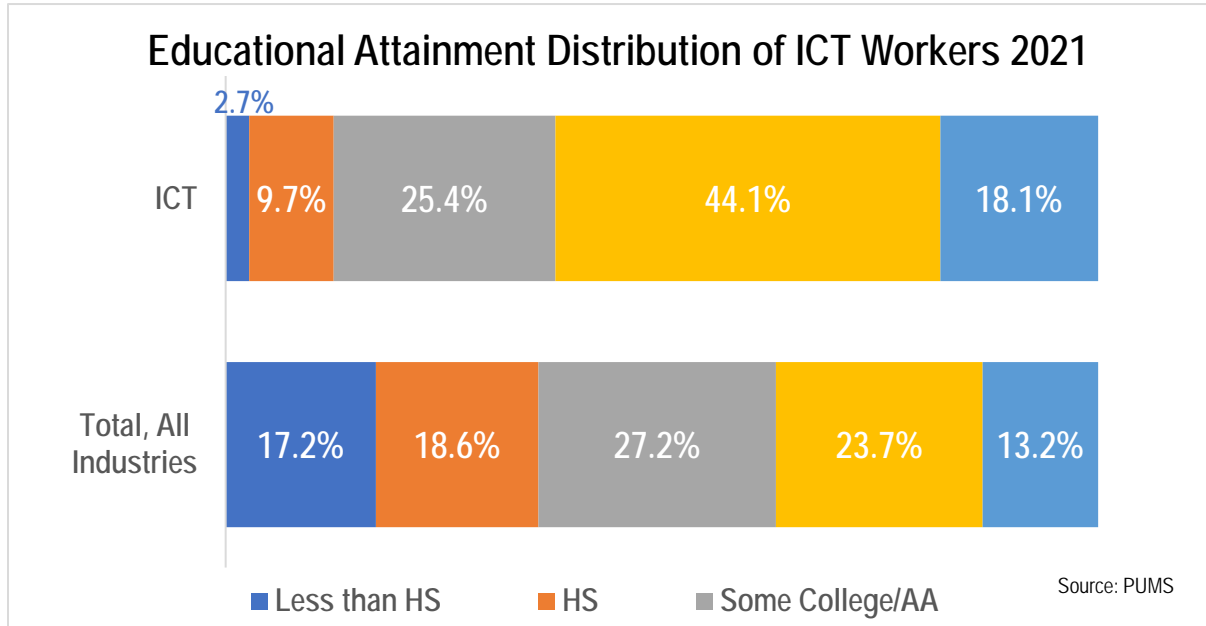
Top 5 companies in the Corporate, Subsidiary and Managing Offices industry and their share of job posts in 2022. Over 56 percent of job posts in 2022 were made by the top 5 companies in the industry.

Industry Demographics

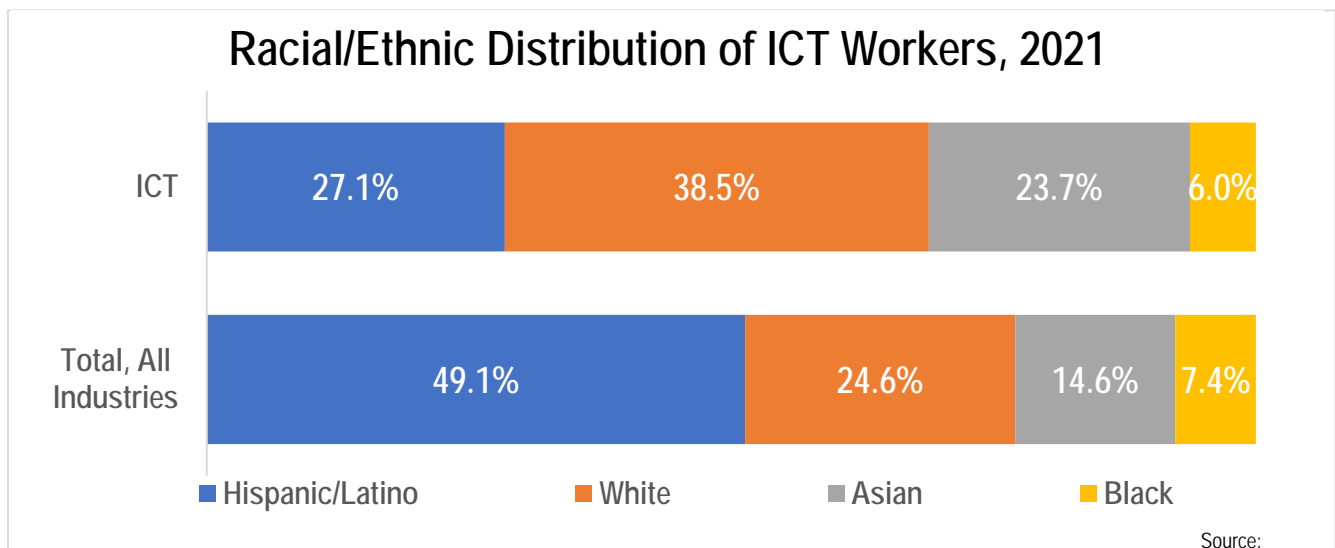


Source: PUMS

Almost 48 percent of employees in Information and Communications Technology industries are between 25 and 39 years old, about 25 percent more than in other industries in Los Angeles County. More generally, ICT industries are marginally younger than other industries, with 2.5 percent more workers under 40.

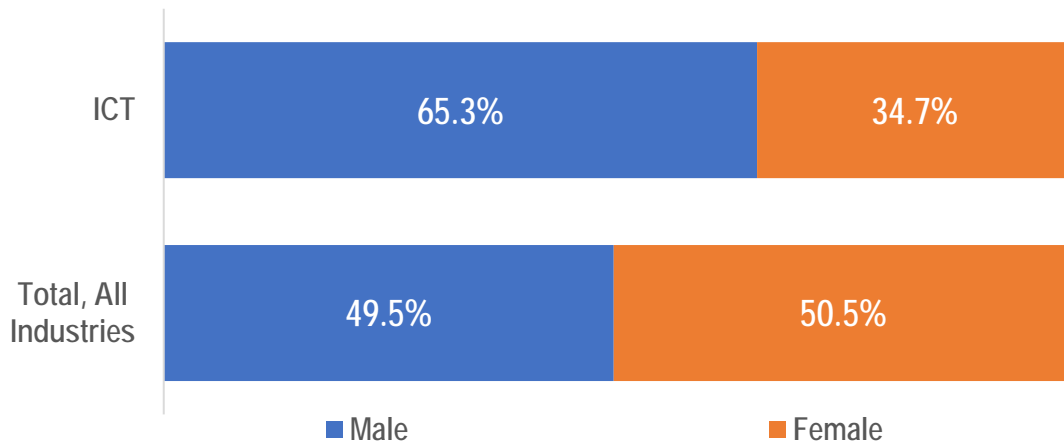


About 44 percent of employees in Information and Communications Technology industries have a Bachelor’s degree, about 20 percent more than in other industries in Los Angeles County. Compared to other industries, ICT jobs are not as accessible to workers with a High School diploma or less.



Hispanic/Latino, Asian, and Black workers are underrepresented in ICT industries, with about 14 percent more White workers compared to other industries in Los Angeles County.

Gender Distribution of DME Workers, 2021



Source: PUMS

Female workers are underrepresented in Information and Communications Technology industries compared to other industries in Los Angeles County, with 15.8 percent fewer female workers.

Occupation Demographics

Source: PUMS

Metric		Computer Support Specialists	Network and Computer Systems Administrators	Information Security Analysts	Web Developers
Sex	Male	79.0%	79.6%	78.5%	72.1%
	Female	21.0%	20.4%	21.5%	27.9%
Education	Less than HS	1.1%	0.2%	0.0%	0.6%
	High School	7.8%	4.0%	1.8%	5.0%
	Some College/Associates	37.0%	34.0%	21.7%	26.7%
	Bachelor's	44.0%	48.6%	56.7%	48.9%
Age	Graduate School	10.0%	13.2%	19.8%	18.8%
	<25	7.6%	5.4%	12.2%	6.4%
	25-39	48.2%	34.7%	42.3%	54.6%
	40-54	27.8%	36.3%	29.3%	25.2%
Race	>54	16.4%	23.6%	16.2%	13.8%
	Hispanic/Latino	28.0%	23.9%	21.1%	20.9%
	White	37.0%	37.9%	36.6%	45.6%
	Asian	23.5%	29.9%	20.0%	24.4%
	Black	7.6%	6.1%	13.5%	4.0%

These occupations are accessible to workers with some college/AA degree or a Bachelor's degree, with about 75 to 82 percent of workers in these occupations with similar levels of education. These occupations are accessible to workers under 40, with over 55 percent of workers in 3 occupations being in that age range and almost 40 percent for Network and Computer Systems Administrators. Hispanic/Latino and Female workers are underrepresented across all 4 occupations, with about 20 to 30 percent less Hispanic/Latino and Female workers than the average for other industries in Los Angeles County.

INFORMATION TECHNOLOGY SUPPLY DATA

Community College Talent Supply

All nineteen community colleges in the Los Angeles region have existing programs that train students in various information technology-related disciplines. Specific community colleges with relevant programs are listed in the table below by program focus. Regional employers having difficulty hiring for IT work roles can proactively connect with the colleges listed to establish a reliable talent pipeline to avoid current and future workforce shortages.

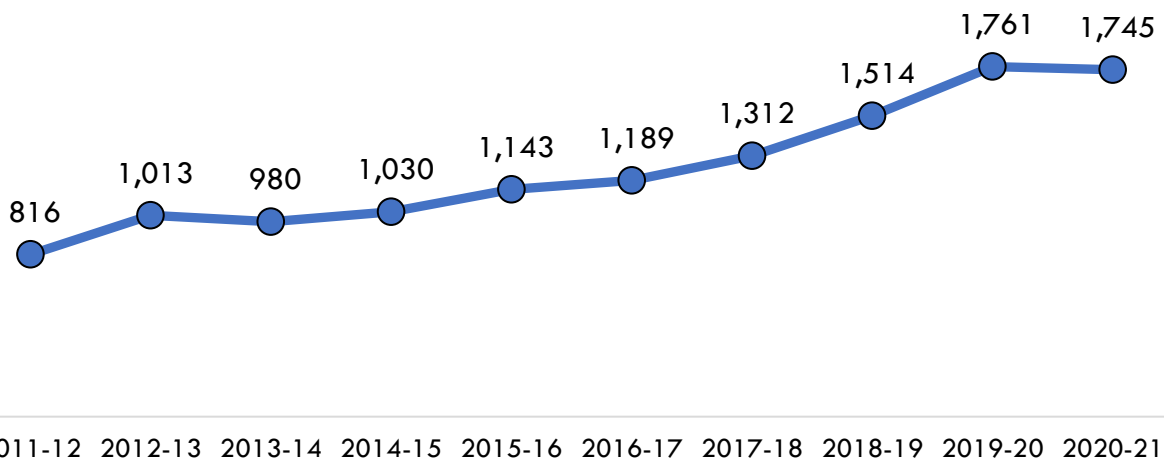
Information Technology			
Computer Programming	Computer Information Systems	Computer Infrastructure and Support	Computer Networking
Cerritos Citrus East L.A. El Camino Glendale L.A. City L.A. Harbor L.A. Mission L.A. Pierce L.A. Southwest L.A. Valley Long Beach City Mt. San Antonio Pasadena City Santa Monica West L.A.	Citrus Compton East L.A. El Camino Glendale L.A. City L.A. Harbor L.A. Mission L.A. Southwest L.A. Trade-Tech Long Beach City Mt. San Antonio Rio Hondo Santa Monica West L.A.	Cerritos El Camino Glendale L.A. City L.A. Harbor L.A. Mission L.A. Southwest L.A. Valley Long Beach City Mt. San Antonio Pasadena City Rio Hondo West L.A.	Cerritos El Camino Glendale L.A. City L.A. Pierce Long Beach City Mt. San Antonio Rio Hondo Santa Monica West L.A.
Information Technology, General	Computer Systems Analysis	Computer Support	World Wide Web Administration
Citrus East L.A. Glendale L.A. Harbor L.A. Mission L.A. Southwest Long Beach City Mt. San Antonio Santa Monica West L.A.	Cerritos L.A. City L.A. Harbor L.A. Mission L.A. Pierce L.A. Trade-Tech Mt. San Antonio Rio Hondo Santa Monica	Citrus El Camino Glendale L.A. Pierce L.A. Valley Long Beach City Pasadena City	Cerritos Glendale L.A. Pierce Long Beach City Mt. San Antonio Santa Monica West L.A.

Information Technology (cont.)			
Computer Software Development	Computer Science (Transfer)	Software Applications	Database Design and Administration
El Camino L.A. Mission L.A. Pierce L.A. Southwest Santa Monica West L.A.	Cerritos Citrus Glendale L.A. City Long Beach City Rio Hondo Santa Monica West L.A.	Cerritos Glendale L.A. City L.A. Mission Long Beach City Mt. San Antonio Santa Monica	Citrus Long Beach City Mt. San Antonio Pasadena City Santa Monica
Other Information Technology	E-Commerce (Technology emphasis)	Other notable IT programs offered by the LA Community Colleges	
East L.A.	Glendale Mt. San Antonio	Cybersecurity, Cloud Computing/Amazon Web Services, Data Science/Analytics, Artificial Intelligence and Machine Learning	

Information and Communication Technologies-Digital Media (ICT-DM) Student Completions

Over the past ten academic years, student completions in the Information and Communication Technologies-Digital Media (ICT-DM) sector have increased steadily. During the 2011-12 academic year, 816 students were awarded ICT-DM degrees or certificates. This number more than doubled to 1,745 students during the 2020-21 academic year. The exhibit below shows the breakdown by academic year, from 2011 to 2021.

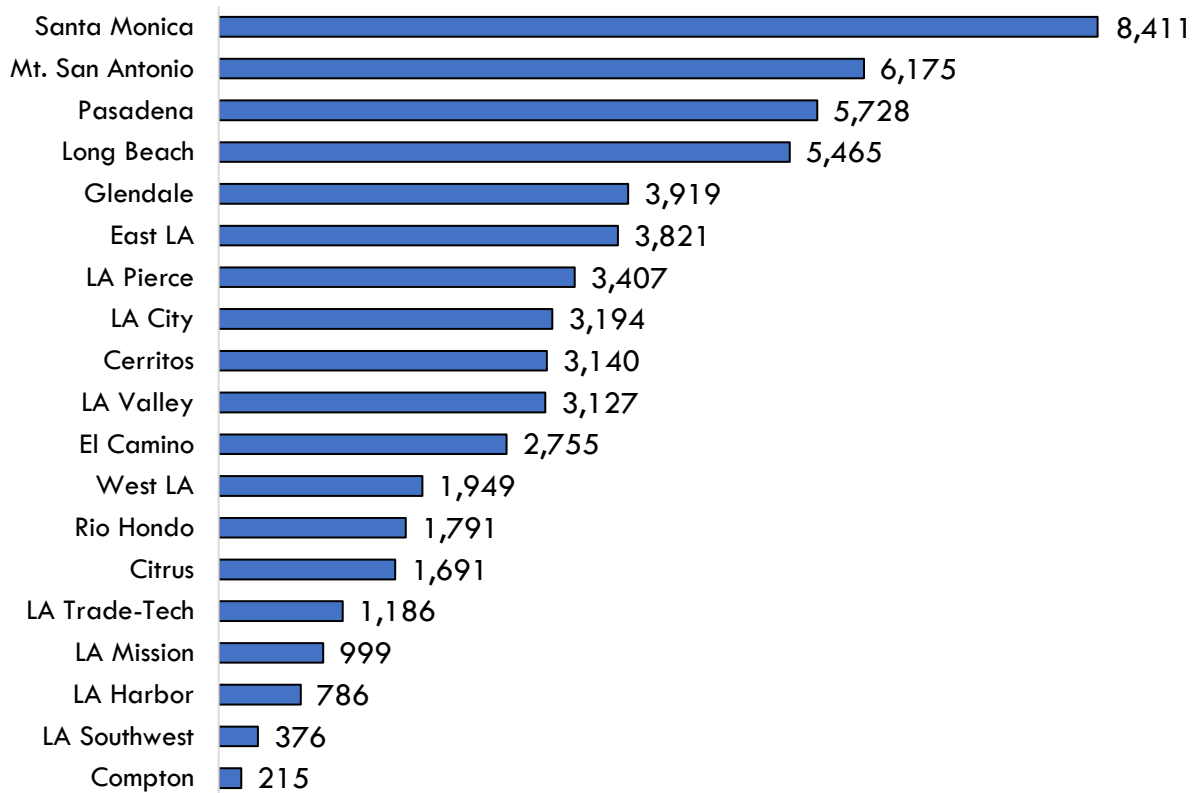
**LA ICT-DM Students who Earned a Degree or Certificate
2011-12 to 2020-21**



Source: [California Community Colleges Chancellor's Office LaunchBoard](#)

There were 55,901 students enrolled in ICT-DM pathways at the nineteen community colleges in the Los Angeles region during the 2020-21 academic year. A closer look at student enrollments in ICT-DM pathways during the 2020-21 school year shows four LA County colleges with more than 5,000 student enrollments each: Santa Monica, Mt. San Antonio, Pasadena, and Long Beach. The number of ICD-DM student enrollments by college can be visualized in the exhibit below.

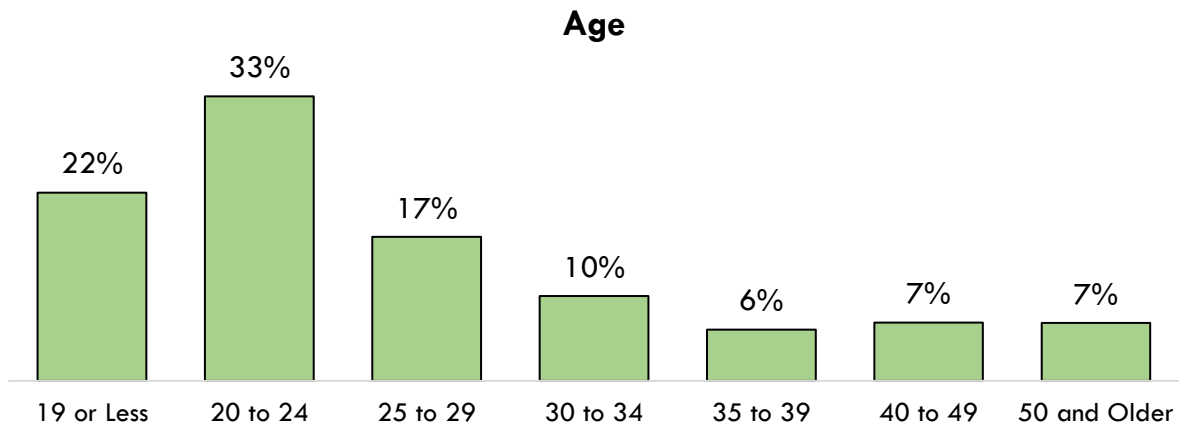
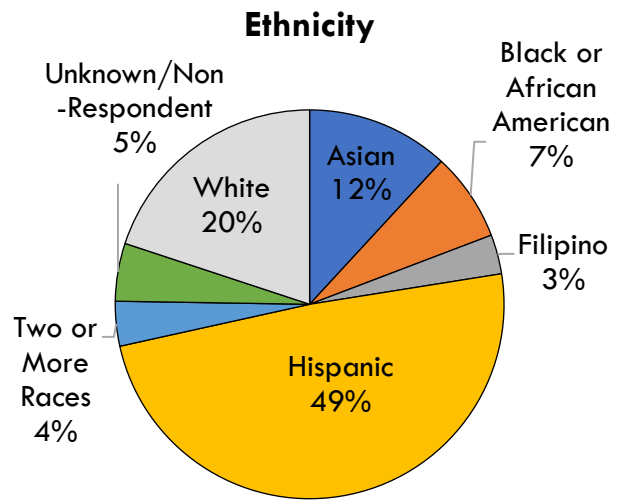
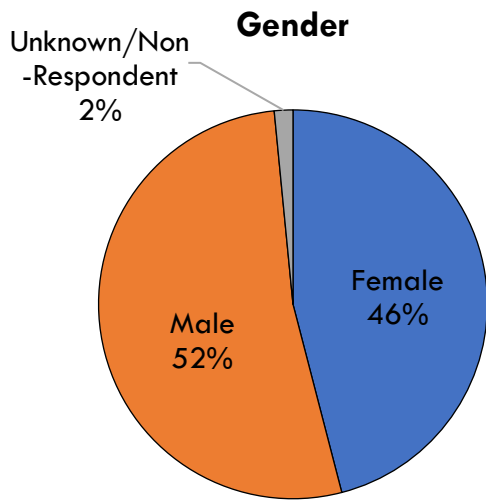
LA ICT-DM Student Enrollments by College, 2020-21



Source: [California Community Colleges Chancellor's Office LaunchBoard](#)

ICT-DM Student Demographics

A little more than half of ICT-DM students at the LA community colleges are male, about half identify as Hispanic, and the majority of students are 24-years-old or younger. This young group of ethnically and gender-diverse ICT-DM students represents the new workforce entering LA's information technology industry. LA ICT-DM student demographics from the 2020-21 academic year, based on the 55,901 students enrolled that year, are displayed in the exhibits below.



Source: [California Community Colleges Chancellor's Office LaunchBoard](#)

Information Technology (IT) Programs at-a-glance

The table below displays the number of awards issued (certificates and degrees) from LA's information technology (IT) programs over the most recent three academic years. Computer programming has issued the largest number of awards, averaging 238 over the past three years, followed by computer science (transfer), and information technology, general. The number of awards issued by these IT programs has increased by 33% since 2019, from 1,107 in 2019-20 to 1,471 in 2021-22.

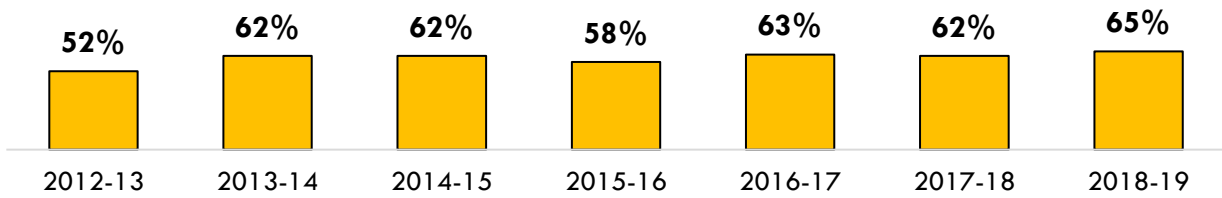
Program Title - TOP6	2019-20	2020-21	2021-22	Latest 3 Yr Avg
Computer Programming - 0707.10	217	218	278	238
Computer Science (Transfer) - 0706.00	147	222	259	209
Information Technology, General - 0701.00	172	167	182	174
Computer Information Systems - 0702.00	170	88	205	154
Computer Networking - 0708.10	145	136	141	141
Computer Infrastructure and Support - 0708.00	83	118	149	117
Computer Support - 0708.20	60	84	62	69
World Wide Web Administration - 0709.00	40	68	61	56
Database Design and Administration - 0707.20	23	47	46	39
Software Applications - 0702.10	29	12	24	22
Computer Systems Analysis - 0707.30	5	9	30	15
Other Information Technology - 0799.00	15	4	13	11
Computer Software Development - 0707.00	0	5	19	8
E-Commerce (Technology emphasis) - 0709.10	1	1	2	1
Total	1,107	1,179	1,471	1,252

Source: [California Community Colleges Chancellor's Office Management Information Systems Data Mart](#)

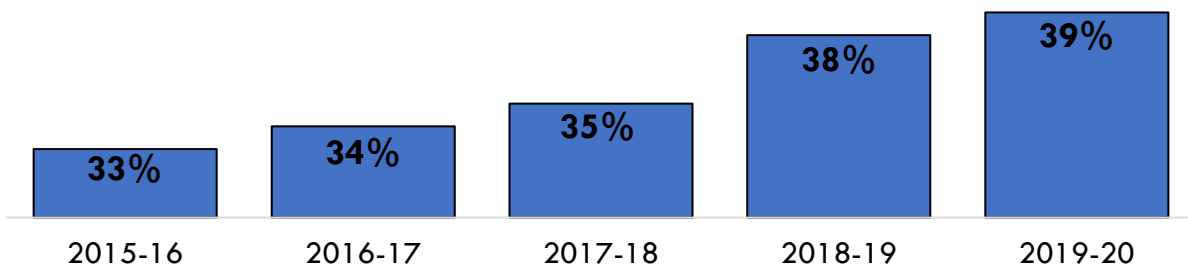
ICT-DM Student Employment Outcomes

According to LaunchBoard data, between 52% and 65% of students exiting LA's ICT-DM programs are working in a job closely related to their field of study (based on the years 2012-2019). Since the 2015-16 academic year, students who have attained a living wage after exiting has increased from 33% (2015-16) to 39% (2019-20). While students are attaining a living wage more frequently after exiting an ICT-DM community college program, the majority of students exiting these programs are not earning a living wage in Los Angeles County. This pattern of lower-wage jobs for exiting community college students can also be seen when looking at annual earnings. Since the 2014-15 academic year, students are increasing their earnings by between 21% and 30% after exiting ICT-DM programs at LA community colleges. Median annual earnings for exiting students have also increased over the last five years, with students earning \$31,500 in 2019-20. While it is a positive trend that students are earning more money after exiting community college programs, these median annual earnings are still less than the living wage in Los Angeles County (\$38,217). There are several potential explanations for these lower-than-average earnings, including the likelihood that most exiting students are working in entry-level positions and the large share of gig workers in the entertainment industry as compared to other LA county industries (such as information technology). Regardless, the rising rate of inflation coupled with increasing living costs places a premium on our students landing jobs that pay above a living wage to adequately support themselves and in many cases, their families.

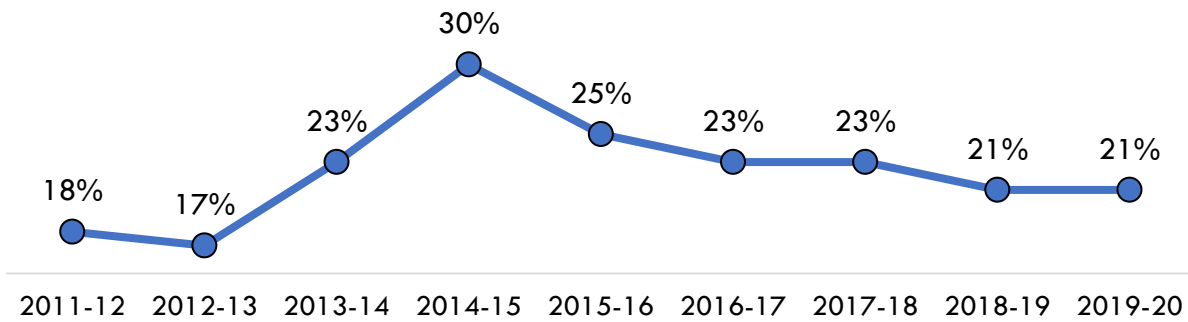
LA ICT-DM Students with a Job Closely Related to Their Field of Study



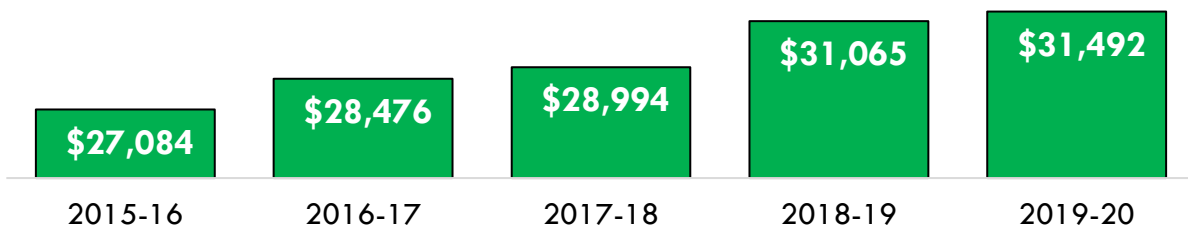
Exiting ICT-DM Students Who Attained the Living Wage



Median Change in Earnings for Exiting LA ICT-DM Students



Median Annual Earnings for Exiting LA ICT-DM Students



Source: [California Community Colleges Chancellor's Office LaunchBoard](#)

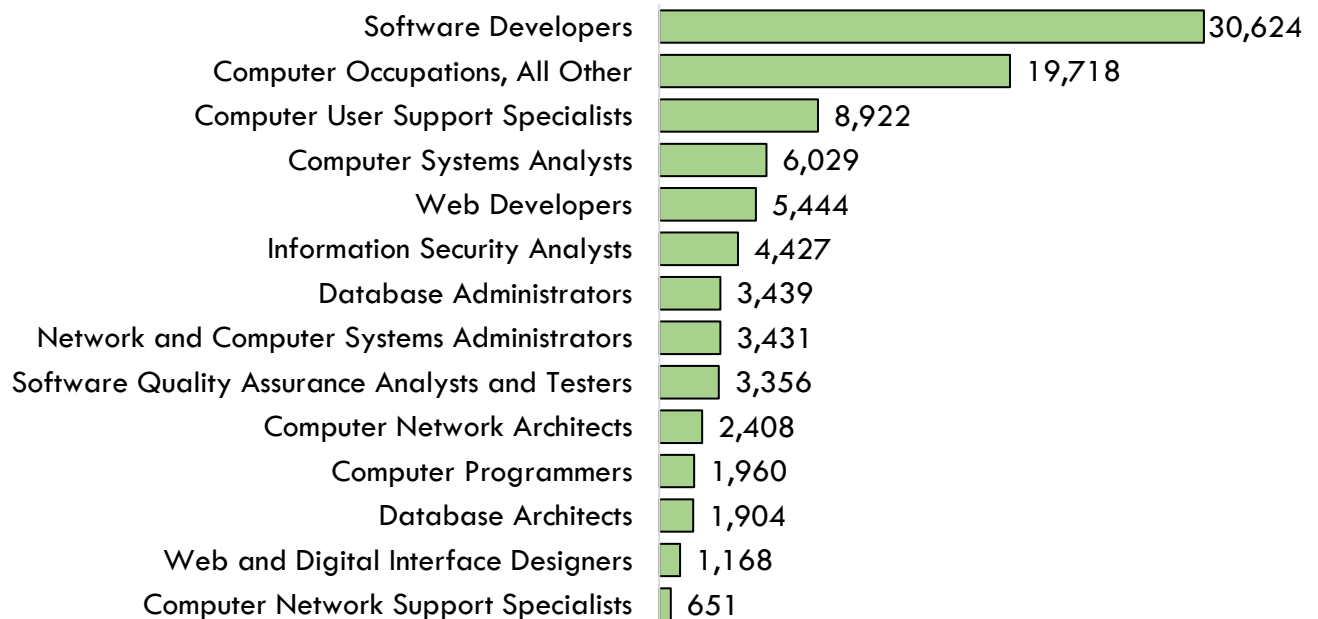
Target IT Occupations for Regional Training Programs

Occupation	2021 Jobs	2026 Jobs	2021 - 2026 % Change	Avg. Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Software Developers	37,484	43,412	16%	3,841	\$45.92	\$61.13	\$76.62
Computer Occupations, All Other	19,803	21,060	6%	1,702	\$27.68	\$38.03	\$60.93
Computer User Support Specialists	16,426	17,854	9%	1,607	\$22.33	\$29.34	\$38.50
Computer Systems Analysts	13,686	14,559	6%	1,162	\$37.95	\$49.88	\$65.63
Network and Computer Systems Administrators	6,737	7,125	6%	543	\$35.36	\$45.80	\$57.91
Web Developers	5,422	6,348	17%	620	\$20.49	\$34.19	\$47.06
Computer Programmers	5,328	5,456	2%	409	\$27.07	\$45.67	\$61.61
Software Quality Assurance Analysts and Testers	5,033	5,626	12%	496	\$35.98	\$48.23	\$61.66
Web and Digital Interface Designers	4,822	5,792	20%	634	\$21.10	\$33.58	\$52.52
Computer Network Architects	4,221	4,383	4%	302	\$38.58	\$54.44	\$73.73
Computer Network Support Specialists	3,790	4,119	9%	370	\$25.70	\$31.31	\$39.83
Information Security Analysts	2,681	3,218	20%	318	\$45.11	\$57.80	\$67.24
Database Architects	2,453	2,586	5%	198	\$36.89	\$36.89	\$57.72
Database Administrators	2,152	2,338	9%	190	\$35.08	\$47.62	\$62.55
Total	130,038	143,875	11%	12,391	-	-	-

Source: [Lightcast, datarun 2023.1](#)

Employer Job Postings

Over the past 12 months (Apr 2022 through Mar 2023), there were 93,481 online job postings for the 14 occupations of interest. The majority of job postings (33%) were for *software developers*, followed by *computer occupations, all other* (21%), and *computer user support specialists* (10%).



The highest number of job postings by job title were for software engineers, systems engineers, data engineers, principal software engineers, and principal systems engineers. The top employers, by number of job postings, in Los Angeles County were Northrop Grumman, Boeing, and CyberCoders. The top software skills desired by employers for potential job candidates were Python (programming language), Amazon Web Services, SQL (programming language) Java (programming language), and JavaScript (programming language).

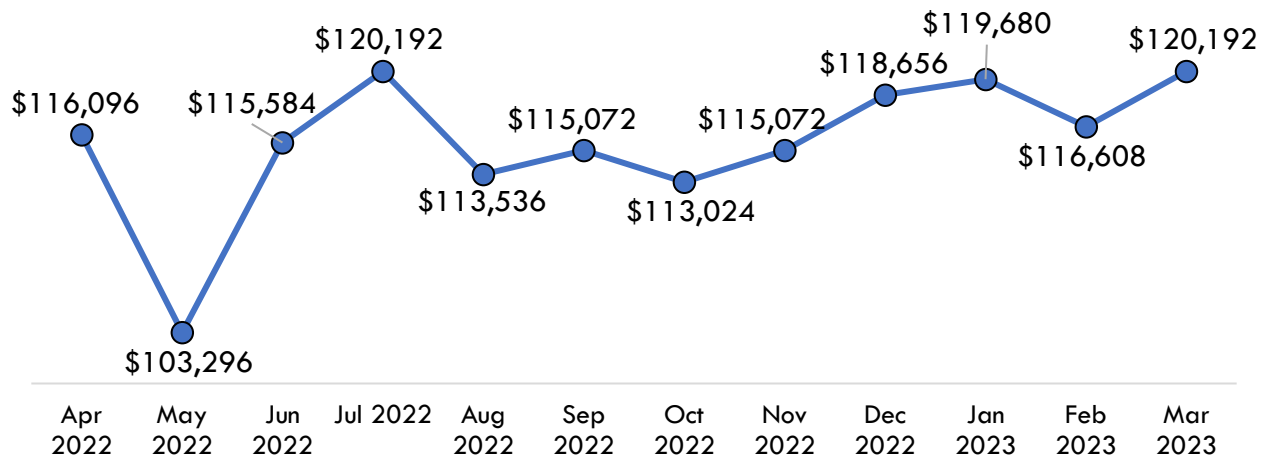
Top Job Titles and Employers from Job Postings

Job Title	Job Ads	Employer	Job Ads
Software Engineers	3,361	Northrop Grumman	3,621
Systems Engineers	1,407	Boeing	3,526
Data Engineers	1,064	CyberCoders*	2,262
Principal Software Engineers	980	Motion Recruitment*	2,180
Principal Systems Engineers	856	Jobot*	1,564
DevOps Engineers	809	Amazon	1,376
Network Engineers	726	Disney	1,252
Systems Administrators	696	Robert Half*	1,153
Software Development Engineers	662	Randstad*	1,018
Software Developers	588	Deloitte	902
Business Systems Analysts	570	Elevance Health	789
Full Stack Developers	553	UnitedHealth Group	780
Full Stack Software Engineers	507	Raytheon Technologies	708

*Indicates staffing company

Since April 2022, advertised wages from job postings for these 14 information technology occupations have risen by 3.5%. The months with the highest advertised wages over the year were July 2022 and March 2023, with job postings averaging an annual salary of \$120,192. Of the job postings that listed minimum experience criteria, the majority (36%) were for positions asking for 4-6 years of work experience; only 9% of job postings were for entry-level positions (0-1 year experience). Of the 61% of job postings listed a minimum education requirement for these information technology occupations, 9% listed a high school diploma or GED, 6% listed an associate degree, and 85% listed a bachelor’s degree.

Advertised Wage Trend Over Last 12 Months

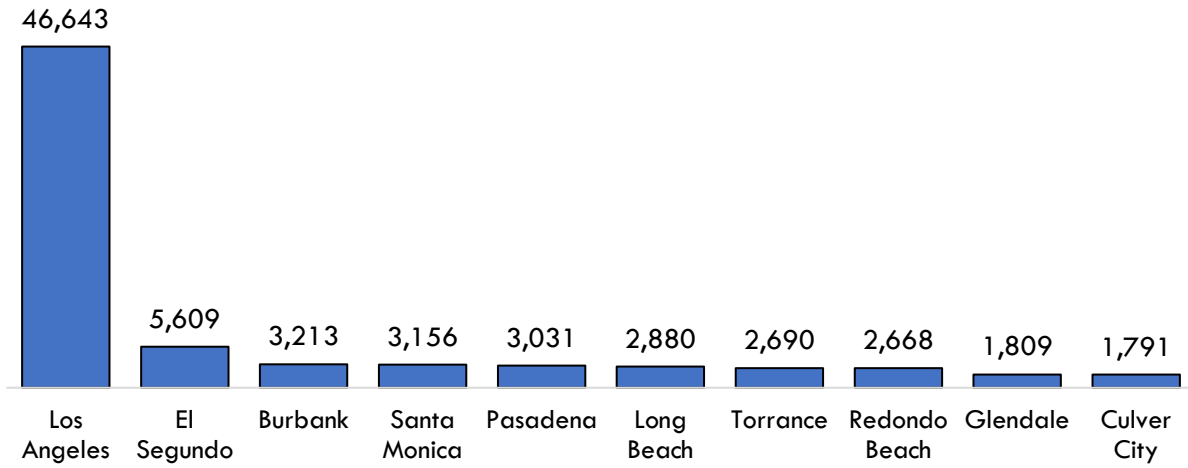


Top qualifications from job postings beyond various security clearances included Certified Information Systems Security Professional (CISSP), CompTIA Security+ Certification, and Project Management Professional (PMP) Certification.

Top Qualifications	Job Ads
Certified Information Systems Security Professional (CISSP)	2,516
CompTIA Security+ Certification	1,453
Project Management Professional (PMP) Certification	1,371
CompTIA A+ Certification	1,353
Cisco Certified Network Associate (CCNA)	1,118
Certified Information Security Manager (CISM)	1,028
GIAC Cyber Security Certifications	958
Certified Information System Auditor (CISA)	909
Cisco Certified Network Professional (CCNP)	858
Microsoft Certified Systems Engineer (MCSE)	712

Within Los Angeles County, the top cities for these information technology jobs were Los Angeles, El Segundo and Burbank. Los Angeles accounted for 50% of the county’s job postings.

Top Job Postings by City



Source: [Lightcast, Job Postings, datarun 2023.1](#)

COMMUNITY COLLEGE REPRESENTATION

Cerritos College

Program Name	Computer And Information Sciences: Cloud Computing, Certificate
Website	https://www.cerritos.edu/cis/default.htm
Overview	<p>The Cloud Computing program prepares students to design solutions for Infrastructure as a Service (IaaS) architectures by provisioning computing instances, establishing virtual private networks, managing databases and storage within a secure online environment. Students produce dynamic solutions responsive to information and computing technology workloads with on-demand pay-as-you-go pricing allowing flexibility for small business, entrepreneurship and enterprise adoption.</p> <p>Industry certifications are embedded to prepare for occupations in Cloud Architect, Cloud Support Associate, Cloud Engineer or Cloud Technicians. Some preparation in information technology or computer programming is recommended.</p>

For more information, contact:

Dean Mellas, Computer Information Systems Department Co-Chair, dmellas@cerritos.edu

Citrus College

Program Name	Gaming And Applications Development, Certificate
Website	http://catalog.citruscollege.edu/disciplines/computer-science/
Overview	<p>This certificate of achievement in Gaming and Applications Development is designed to develop students' skills in computer programming and software development. The certificate equips students with the current methods of computer programming used to solve problems in both the private and public sector. Some of the programming languages demonstrated include C, C++, C#, Assembly language, Java, Visual Basic and Python. This certificate prepares the student for the following job titles: Entry Level Computer Programmer, Applications Programmer and Entry Level Game Programmer.</p>

For more information, contact:

Kimberly Mathews, Career, Technical and Continuing Education Dean,
kmathews@citruscollege.edu

Compton College

Program Name	Computer Systems Application, Certificate
Website	https://www.compton.edu/academics/business-industrial-studies/computer-information-systems/index.aspx
Overview	The Computer Systems Applications certificate of achievement is intended for students interested in information systems, and can lead to career opportunities as software specialists, web programmers, database developers, systems analysts or network administrators. The variety of courses will enable students to learn project management, perform systems analysis and design, create business software including websites, desktop applications, mobile apps, manage business data using spreadsheets and databases, implement cybersecurity measures, handle help desk incident reports, and install and maintain small and large LANs (local area networks). Students will demonstrate their proficiency through performance in laboratory exercises and objective examinations.

For more information, contact:

Dr. Paul Flor, Dean of Student Learning, pflor@compton.edu

East Los Angeles College

Program Name	Computer Science Information Technology, AA
Website	https://www.elac.edu/academics/pathways/balit/business-admin-dept/computer-science
Overview	The Computer Science/Computer Information Systems courses will teach students the basic principles of computing, to major programming languages (Visual Basic, JavaScript, Java, C#, C++, and Python). ELAC also offers courses in the exciting fields of computer applications, database, operating systems, computer networks, cyber security, cloud computing, and web design.

For more information, contact:

Frank Aguirre, Computer Science Department Chair, aguirrfj@elac.edu

El Camino College

Program Name Computer Science, Certificate

Website <https://www.elcamino.edu/academics/divisions/mathematical-sciences/computer-science/index.aspx>

Overview By completing the certificate requirements, the student will apply program design principles and will acquire an understanding of data structures and their applications for an analysis and solution of numeric and non-numeric problems. The student will write programs using the Java, C++, and assembly computer languages. All courses have a mandatory computer laboratory component requiring students to apply knowledge of the concepts from the lecture.

For more information contact:

Dr. Marlow Lemons, Dean of Mathematical Sciences, mlemons@elcamino.edu

Glendale College

Program Name Computer Information Systems, Certificate

Website <https://www.glendale.edu/academics/degree-certificate-programs/certificate-programs/computer-information-systems-nd>

Overview This degree or certificate is designed to prepare students for employment in the IT workforce as entry-level Programmers, entry-level Database Programmers, Application Analysts, Programmer Analysts, Business Analysts, System Analysts, PC Support Specialists, Technical Support, User Support Specialists and etc. Students will demonstrate their proficiency through performance in laboratory exercises and objective examinations. The student will analyze simple business or technical problems relevant to programming, and prepare solutions to them; implement a program in either C/C++ or Java, using objects; and demonstrate an understanding of the operations and processes of a computer relevant to programming.

For more information contact:

Freddy Saucedo, Dean of Career Technical Education, fsaucedo@glendale.edu

Long Beach City College

Program Name	Cloud Computing, AS or Certificate
Website	https://www.lbcc.edu/cloudcomputing
Overview	The Cloud Computing program provides the student with the industry skills to understand, build, and maintain cloud applications. These skills include the technical principles of the hardware and software requirements to run systems in the cloud, including storage, database management, and software systems, while maintaining secure access.

For more information contact:

Miriam Valceschini-Lynch, Computer & Office Studies Department Chair,
mlynch@lbcc.edu

Los Angeles City College

Program Name	Data Science, Certificate
Website	https://www.lacitycollege.edu/academics/aos/computer-science
Overview	The Data Science certificate of achievement provides students with foundational and practical knowledge and training to prepare them for entry-level careers in Data Science or Data Analytics. The program touches on both the Mathematical and Computational areas of the subject matter including Descriptive and Inferential Statistics, Programming & Analysis Tools such as Python and R, and existing AWS Cloud Services such as Data Lake, Athena, Glue, and Redshift. The program also helps prepare students with an appropriate background for the Data Analytics specialty certification from AWS. Topics include Data Exploration and Visualization with Jupyter, Regression Analysis, and other Data Science tools such as numpy, scipy, pandas, matplotlib, seaborn, statsmodels, scikitlearn, keras, and TensorFlow.

For more information contact:

Shawki Dakduk, Computer Science Department Chair, dakduks@lacitycollege.edu

Los Angeles Harbor College

Program Name	Computer Information Systems, AS or Certificate
Website	https://www.lahc.edu/academics/aos/cis
Overview	The program will prepare students for continued study and professional work in various areas of computer information systems. This program includes foundation courses in cloud computing, programming, and web security.

For more information contact:

Wendy Hoffman, Computer Applications Division Chair, hoffmawk@lahc.edu

Los Angeles Mission College

Program Name	Cloud Computing, Certificate
Website	https://www.lamission.edu/academics/aos/cloud-computing
Overview	The Cloud Computing program prepares students to design solutions for Infrastructure as a Service (IaaS) architectures by provisioning computing instances, establishing virtual private networks, managing databases and storage within a secure online environment. Students produce dynamic solutions responsive to information and computing technology workloads with on-demand pay-as-you-go pricing allowing flexibility for small business, entrepreneurship and enterprise adoption. Industry certifications are Program Proposal Attributes embedded to prepare for occupations in Cloud Architect, Cloud Support Associate, Cloud Engineer or Cloud Technicians.

For more information contact:

Bamdad Samii, Computer Science Department Chair, samiib@lamission.edu

Los Angeles Pierce College

Program Name	Cloud, Networking, & Cybersecurity, AS
Website	https://programmapper.piercecollege.edu/academics/interest-clusters/d751e218-8964-4d43-ab2d-c3dd10011658/programs/9dfe0233-c775-e8b5-42fa-175676d7f1af

Overview

This two-year program provides in-depth knowledge and hands-on experience for students who wish to start or enhance their careers in Cloud, Networking, and Cybersecurity. Graduates will be prepared to design and deploy secured network domains to support applications and operations in the Cloud and on premises. Students gain skills and knowledge in configuration and troubleshooting of network routers, switches and firewalls; Windows and Linux server installation and configuration; and implementation of effective cybersecurity measures such as prevention of hacking activities. Additionally, the comprehensive scope of the classes provides students with a combination of job skills readiness and preparation for highly respected industry certificates such as AWS Cloud Practitioner, AWS Solutions Architect Associate, AWS Security Specialty, Cisco Certified Network Associate (CCNA), Cisco Certified CyberOps Associate, Azure Fundamentals, Azure Administrator, EC-Council Certified Ethical Hacking (CEH), and RedHat Certified System Administrator. Pierce is a member of the Cisco Networking Academy (Netacad), AWS Educate, Microsoft Academy, RedHat Academy. As a result, students gain access to industry standard curriculum, simulation tools, and certification preparation materials.

For more information contact:

Eleanor Viz, Computer Applications & Office Technologies Department Chair,
vize@piercollege.edu

Los Angeles Southwest College

Program Name Computer Science: Information Technology, AS

Website <https://www.lasc.edu/academics/aos/cs-it>

Overview This degree prepares students to start programming and get an introduction to computer science. Students will learn new software and learn about databases, their structures, and multiple uses in a business environment. In addition, students will dive into the diversity of today's computer science and information technology by learning how to research new industry trends and products to stay on top of all that is happening in the industry.

For more information contact:

Dr. Allison Moore, Business Department Chair, mooreap@lasc.edu

Los Angeles Trade Technical College

Program Name	Computer Information Systems, AS or Certificate
Website	https://www.lattc.edu/academics/aos/computer-information-systems
Overview	The Computer Information Systems program is designed to prepare students for careers in the exciting Information Technology fields such as programming, software engineering, database administration, computer networking, multimedia programming, and web programming technologies. Microcomputer usage continues to grow at an ever increasing pace as does the demand for workers with solid technical skills and knowledge of programming, networking, and website development and management. The primary goal of the program is to prepare students for entry-level employment as well as providing marketable career advancement knowledge and skills.

For more information contact:

Dr. Rose Gathoni Maina, Business & Civic Engagement Department Chair, MainaRG@lattc.edu

Los Angeles Valley College

Program Name	Computer Science, AS
Website	https://programmap.lavc.edu/academics/interest-clusters/fa0e4bcf-46df-4fc9-9644-d76f437c1560/programs/0590493c-3bcf-9056-4963-bfec7937766d
Overview	The Computer Sciences program will enable students to gain valuable skills and techniques in the highly competitive world of Information Technology. The course offerings are designed to provide a general overview of the industry while also concentrating on specific job skills.

For more information contact:

Dr. Michael Rahni, Computer Science and Information Systems Department Chair, rahnimk@lavc.edu

Mt. San Antonio College

Program Name	Computer Information Systems Professional in Network Security, Certificate
Website	https://catalog.mtsac.edu/programs/programsaz/computer-network-administration-and-security-management/cis-professional-certificate-network-security/
Overview	The CIS Professional in Network Security program is designed to prepare students for a career in the computer network security industry. The certificate offers a balanced set of classes that prepare students to design, implement, manage and secure the heterogeneous corporate network. The

security management courses emphasize firewall security appliances, network protocol analysis, Linux network, Snort intrusion detection, intrusion prevention, and vulnerability management. Students will acquire the skills to utilize network protocol analyzers, to troubleshoot network problems, deploy intrusion prevention systems, configure firewall security appliances and Virtual Private Network (VPN), and assess network vulnerabilities and implement countermeasures. Individual courses will help students prepare for industry certification exams such as Certified Ethical Hacker (CEH), Cisco Firewall Specialist, and Cisco IPS Specialist. Opportunities available upon completion of the certificate program include Network Security Analyst, Junior Network Security Engineer, Network Vulnerability Management, and Network Security Architect.

For more information contact:

Barry Andrews, Computer Information Systems Department Chair, bandrews@mtsac.edu

Pasadena City College

Program Name	Computer Information Systems – Cybersecurity, AS or Certificate
Website	https://pasadena.edu/academics/degrees-and-certificates/certificates-of-achievement/cybersecurity.php
Overview	This cybersecurity program prepares students with necessary skills to seek employment in the field of Information Technology to administer enterprise network security. Instruction includes training in basic enterprise system and network administration with an emphasis on system and network security, and computer forensics. Students are exposed to a wide variety of security analysis/defensive tools, and students implement these tools. Upon completion of coursework, students will have the foundation needed to pursue industry certifications such as Python Institute Certified Entry-Level Python Programmer (PCEP), CompTIA A+, CompTIA Server+, CompTIA Network+, CompTIA Security+, EC-Council Certified Ethical Hacker, Cisco CCT Routing & Switching, Cisco Certified CyberOps Associate, and Microsoft Windows System Administration or CompTIA Linux+/LPI Linux Administrator.

For more information contact:

Carrie Starbird, Dean of Math & Computer Science, castarbird@pasadena.edu

Rio Hondo College

Program Name	Computer Science, AS for Transfer
Website	https://www.riohondo.edu/business/computer-science/

Overview

The Associate in Science in Computer Science for Transfer (AS-T) Degree is intended to meet the lower division requirements for Computer Science majors (or similar majors) at a CSU campus that offers a Computer Science baccalaureate degree. This degree is designed for students interested in an introduction to the field of Computer Science. Computer Science is the study of representational computation, data access methods, programming languages, algorithmic modeling, software design, testing and development. Students in the Computer Science program study and apply their knowledge of mathematics, physics and logic to solve a variety of problems using current technology. Coursework includes programming languages and concepts, systems analysis, mathematics, physics, computer hardware and data structures.

For more information contact:

Gita Runkle, Dean of Business, grunkle@riohondo.edu

Santa Monica College

Program Name	Database Applications Developer, AS or Certificate
Website	https://www.smc.edu/academics/areas-of-interest/stem/csis/computer-science.php
Overview	This program develops user-friendly interfaces to database applications. A database application is made of data, a database engine to store the data, and an interface to extract and display the data. The skills needed to build a database application range from database theory and design, using a database engine such as SQL Server, or Oracle, to programming in ADO technologies to extract the data, as well as programming in Windows and Web applications on a client and server-side basis to present the data. In addition, with increasing concerns over security, a database developer must also be able to write secure code that runs with minimum risk of attacks.

For more information contact:

Howard Stahl, Computer Science Department Chair, stahl_howard@smc.edu

West Los Angeles College

Program Name	Computer Network Security Management, AS or Certificate
Website	https://www.wlac.edu/academics/aos/cnsm
Overview	WLAC's network security curriculum combines the existing MCSE, CCNA and Information System Security training to help students develop skills to design, administer and manage the heterogeneous corporate network with security emphasis.

For more information contact:

Anna Chiang, Computer Science Department Chair, chiangas@wla.edu