El Camino College

2018
CAREER AND TECHNICAL EDUCATION (CTE)
2-YEAR REVIEW

INDUSTRY & TECHNOLOGY

COMPUTER AIDED DESIGN & DRAFTING (CADD)

DEAN:
David Gonzales

CONTRIBUTORS:
Douglas Glenn

TABLE OF CONTENTS

Contents

CAREER AND TECHNICAL EDUCATION (CTE) – 2-YEAR REVIEW
Supplemental Questions

CTE programs must conduct a full program review every 4 years. The comprehensive program review includes responses to the CTE supplemental questions below. Every two years (once between full program reviews) these supplemental questions must be answered and submitted to Academic Affairs for posting on the College website.

Use labor market data, advisory committee input/feedback, and institutional and program-level data to respond to the following questions:

1. **How strong is the occupational demand for the program?** In your response, describe any changes in demand over the past 5 years and discuss the occupational outlook for next 5 years. Provide applicable labor market data (e.g., US Bureau of Labor Statistics, Employment Development Department) that address state and local needs.

   The Los Angeles MSA and ECC Service Areas were surveyed by ECC Institutional Research:

   During the previous 5 years (2013 - 2018) there was an increased demand in Los Angeles and a decrease in the ECC Area.

   The outlook for the next five years is flat and steady across surveyed regions.

   Relevant data that may not be defined or collected, and may have an impact on statistics, involves "other" occupations that require a CADD skill set. These include manager, machinist, inspector, analyst; and others within the overall engineering and manufacturing population.

   The future direction of CADD is into "Metadata/Big data" at an enterprise level; where management, accounting, planning, marketing will need some level of training.

   The next 5 years will be crucial to the overall CADD training effort to ensure that workers will be able to step into high paying technical positions or keep up with the pace of technology.

   Previous 5-Years

Area	2013 Jobs	2018 Jobs	Change	% Change
Los Angeles MSA	17,038	17,751	713	4.2%
ECC Service Area	2,866	2,667	-199	-6.9%

   Next 5-Years

Area	2018 Jobs	2024 Jobs	Change	% Change
Los Angeles MSA	17,751	17,912	161	0.9%
ECC Service Area	2,667	2,602	-65	-2.4%

2. **How does the program address needs that are not met by similar programs in the region?** In your response, identify any distinctive components of the program (e.g., curriculum, facilities, resources) and/or describe any unique contributions the program or its students/graduates make to the community served.

Increasingly, students and employers are turning to ECC and the CADD department to pick up the fall-off in local technology and engineering graphics training.

The El Ca**mino** CADD program utilizes Catia software: the Industry wide gold standard in advanced 3D technology. This software is prominently used by local Aerospace and Automotive companies and their suppliers. Twenty seven years ago, El Camino was selected as 1 of 6 schools nationwide to train utilizing Catia software; and we are still considered an academic leader in the dissemination of this technology. We also train using Autodesk Products(AutoCAD, Inventor); recognized as the leading CADD software in the USA on a "per seat" basis.

In addition, local University engineering programs (ex: Cal State Long Beach, UCLA, Cal State Los Angeles) offer limited or no CADD classes for students. Many CSU engineering students are advised to supplement their education with CADD classes, particularly basic Drafting and Catia, at ECC. We have made it a priority that our CADD classes transfer to CSU and/or UC schools. We are continually updating our technology and curriculum to keep abreast of current local and State requirements for Industry, and transfer requirements to institutions of higher education

3. **What are the completion, success, and employment rates for students in the program?** In your response, identify the standards set by the program and discuss any factors that may impact completion, success, and employment rates among students in the program. Describe the status of any action plans for maintaining/improving rates relative to such benchmarks.

Completion

Program Awards	2013-14	2014-15	2015-16	2016-17	2017-18
Achievements	5	6	6	5	5
Associate Degree	3	10	8	6	10

Source: El Camino College Dataset (Degree and Certificate Report, 2018)

Demographic and Enrollment Characteristics

Computer Aided Design/Drafting

Fall

		Fall Term				ECC Student Population	District Boundary Population
		2013	2014	2015	2016	Fall 2016	2010 Census
Term Headcount		220	180	148	163	*24,000*	*556,400*
Gender	F	15.5%	24.4%	27.0%	12.9%	*51.6%*	*51.0%*
	M	73.6%	97.8%	94.6%	77.9%	*48.4%*	*49.0%*
Ethnicity	African-American	12.3%	17.2%	13.5%	11.0%	*14.6%*	*15.1%*
	Amer. Ind. or Alask. Native	0.0%	1.1%	0.0%	0.0%	*0.2%*	*0.2%*
	Asian	16.8%	23.3%	23.6%	12.9%	*14.8%*	*13.6%*
	Latino	35.0%	50.0%	52.7%	50.3%	*51.5%*	*34.5%*
	Pacific Islander	0.0%	0.0%	0.7%	0.6%	*0.6%*	*0.5%*
	White	21.4%	25.0%	24.3%	13.5%	*13.3%*	*32.8%*
	Two or More	1.8%	3.9%	4.1%	1.8%	*4.6%*	*2.9%*
	Unknown or Decline	1.8%	1.7%	2.7%	0.6%	*0.5%*	*0.4%*
Age/ Age Group	<17	0.0%	0.0%	0.0%	0.0%	*1.7%*	*24.2%*
	17	0.9%	0.0%	0.0%	0.0%	*2.2%*	
	18	2.3%	2.8%	2.7%	3.7%	*12.5%*	*2.5%*
	19	7.3%	7.8%	5.4%	3.7%	*14.8%*	
	20	6.8%	6.7%	5.4%	6.1%	*12.4%*	*1.2%*
	21	6.8%	5.6%	8.8%	3.7%	*9.8%*	*1.2%*
	22	1.8%	9.4%	9.5%	4.9%	*7.5%*	*3.9%*
	23	3.6%	6.1%	12.8%	7.4%	*5.9%*	
	24	5.0%	10.0%	7.4%	4.3%	*4.4%*	
	25-29	15.9%	22.8%	25.0%	17.2%	*13.2%*	*7.4%*
	30-39	14.1%	21.1%	21.6%	22.1%	*8.7%*	*14.9%*
	40-49	12.3%	16.1%	10.1%	5.5%	*3.5%*	*15.9%*
	50-64	10.0%	10.6%	11.5%	11.7%	*2.8%*	*18.1%*
	65+	2.3%	3.3%	1.4%	0.6%	*0.6%*	*10.6%*
Class Load	Full-time	15.5%	26.1%	27.0%	19.0%	*32.8%*	
	Part-time	67.3%	83.9%	83.1%	63.2%	*66.3%*	
Academic Level	College degree	25.5%	37.2%	39.2%	28.2%	*11.8%*	
	HS Grad	59.5%	78.9%	75.7%	56.4%	*82.8%*	
	Not a HS Grad	0.9%	0.6%	0.0%	0.0%	*0.5%*	
	K-12 Special Admit	0.5%	0.0%	0.0%	0.0%	*2.4%*	
	Unknown	2.7%	5.6%	6.8%	6.1%	*4.1%*	

Educational Goal	Intend to Transfer	20.0%	31.1%	23.6%	23.9%	*42.4%*	
	Degree/Certificate Only	- 5 -	5.6%	6.8%	8.6%	*4.6%*	
	Retrain/recertif.	9.1%	11.1%	12.8%	9.8%	*3.8%*	
	Basic Skills/GED	3.2%	3.9%	6.8%	8.0%	*5.7%*	
	Enrichment	5.0%	7.8%	6.1%	5.5%	*2.4%*	
	Undecided	13.2%	14.4%	16.9%	13.5%	*17.0%*	
	Unstated	0.0%	0.0%	0.0%	0.0%	*24.1%*	

Source: El Camino College Program Review Dataset

Employment

"Employment rate data is not available from the ECC Institutional office. Procedures to obtain this data are not in place at ECC or the Chancellors office at this time."

4. **List any licensure/certification exam(s) required for entry into the workforce in the field of study and report the most recent pass rate(s) among program graduates.** In your response, identify any applicable performance benchmarks set by regulatory agencies and describe the status of any action plans for maintaining/improving pass rates relative to such benchmarks.

   The CADD department currently offers Program Certificates and Associate Degrees. We do not offer individual course software exams. However, our training will allow students to complete certificates offered by CADD software vendors AutoDesk (AutoCAD, Inventor), and Dassault Systems (Catia, SolidWorks).

   Please see latest Advisory minutes (APPENDIX B) for suggestions on adding additional certificates. This is currently being discussed and planned for implementation in the near future.

5. **Are the students satisfied with their preparation for employment? Are the employers in the field satisfied with the level of preparation of program graduates?** Use data from student surveys, employer surveys, and other sources of employment feedback to justify your response.

   Employers in the field seem satisfied with the level of preparation of our graduates.

   " CTEOS survey results from 2013-17 shows that 100% of CADD students who responded to the question were satisfied with their preparation for employment "

   El Camino CADD classes have maintained a steady fill rate during this review period. Many CADD students do not require a degree or certificate to advance in their current employment. We focus attention on learning the latest technological tools and processes students need in the current industry environment so that all of our students: Full Time; Part Time; Degree; Certificate; get the latest information.

The CADD program is fortunate to have a great reputation with local companies. We have placed students with Northrop Grumman, Boeing, Gulfstream, and various smaller local manufacturers. Recently, we have established training ties with local companies Impresa Aerospace and the George P. Johnson Company.

We expect that employment interest in our technology-based programs including CADD will continue to remain steady for the foreseeable future.

"No employer satisfaction data is available from the ECC Institutional office. Procedures to obtain this data are not in place at ECC or the Chancellors office at this time"

6. **Is the advisory committee satisfied with the level of preparation of program graduates? How has advisory committee input and feedback been used in the past two years to ensure employer needs are met by the program?** Describe the status and impact of any advisory committee recommendations.

Our advisory committee is very satisfied with the level of preparation of program graduates. This committee plays an important role in continuing to shape the CADD program. Our committee is made up of representatives from Gulfstream, Boeing, Virgin Galactic, Honda and other local industry representatives. The committee is used to exchange and gather information, and questions posed may result in new training or software that responds to current academic and employer needs. The feedback is invaluable to our program as technology and the processes in use change much faster than in other academic disciplines. Through our committee, we are also able to identify future trends in Industry and education, and decide what would be best for our program and students moving forward. Recently, due to past recommendations, we have initiated a drive to attract more Machine Tool Technology students in the use and benefits of CADD.

California Education Code 78016 requires that the review process for CTE programs includes the review and comments of a program's advisory committee.

In Appendices, provide the following information:

a. **Advisory committee membership list and credentials**.
b. **Meeting minutes or other documentation** to demonstrate that the CTE program review process has met the above Education Code requirement.

APPENDIX A
Advisory committee membership list and credentials

ALLEN BAKALYAR - Boeing Satellite Division

JUSTIN BENITES – Gulfstream

DOUGLAS GLENN – El Camino College

ELIZABETH SHEETS – Virgin Galactic

JORGE ULLOA – Honda R & D

DAN VALLADARES – El Camino College

APPENDIX B
Advisory committee meeting minutes and other documentation

Advisory Committee Meeting Minutes

26 April 2018

5:50 PM

6 people present

A report on the plans to acquire the following items was presented:

A storage cabinet for Project Lead The Way materials

A 3D printer

A 3D scanner

It was agreed by all that these are necessary and beneficial additions to the program.

It was suggested that we look into coordination with the art department to create metal castings from our CAD models and 3D printed parts.

The committee unanimously agreed that, in addition to CATIA, both Inventor and SolidWorks are in demand by local industry.

In addition, it was pointed out that both NX and CREO are in demand. Space-X in Hawthorne uses NX and Boeing Satellite Division in El Segundo uses CREO.

It was suggested that we consider 8-week courses for all of the CAD programs, similar to the ones we have for CATIA. The idea of offering advanced classes in SolidWorks and inventor in these 8-week formats was recommended.

It was pointed out that if we add many more classes we will need to hire additional staff to teach them. The CADD department is very limited, because there is only one full-time instructor.

On the subject of certificates and degrees:

The CADD department currently offers 2 certificates and one degree

Everyone agreed that more should be offered

A SolidWorks certificate was suggested

A CATIA certificate was suggested

A certificate to prepare students for the AutoDesk Inventor Certificate was suggested

The new certificates should be designed to meet the requirements for college funding.

The occupation and program data were reviewed, and the following comments were made:

Why isn't El Camino College listed?

Why isn't Cerritos College listed?

Perhaps these programs are listed under architecture?

ECC should collect data on our students, transfers, and graduates.

Meeting adjourned 6:45 pm

APPENDIX C

Emsi 2018 Data Set

Occupation Overview

Emsi Q4 2018 Data Set

October 2018

El Camino College

16007 Crenshaw Blvd
Torrance, California 90506
310.660.3593

Parameters

Occupations

Code	Description
17-2141	Mechanical Engineers
17-3011	Architectural and Civil Drafters
17-3012	Electrical and Electronics Drafters
17-3013	Mechanical Drafters
17-3019	Drafters, All Other

Regions

35 items selected. See Appendix A for details.

Timeframe

2018 - 2024

Datarun

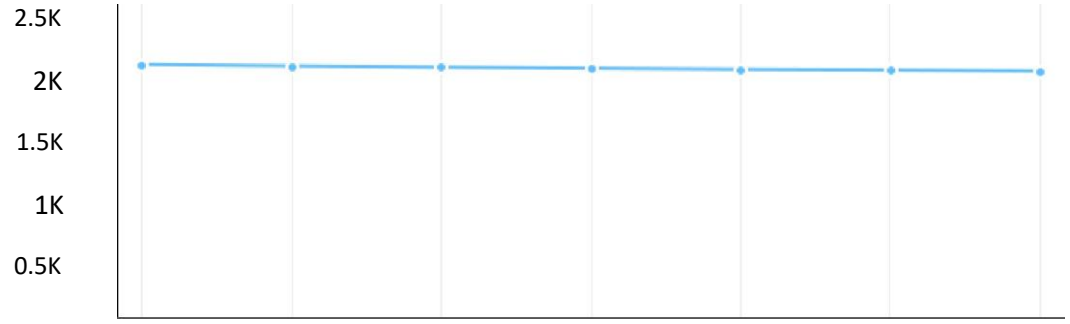
2018.4 - Employees

CC Computer Aided Design/Drafting in ECC ZIP Service Area

Occupation Summary for ECC Computer Aided Design/Drafting

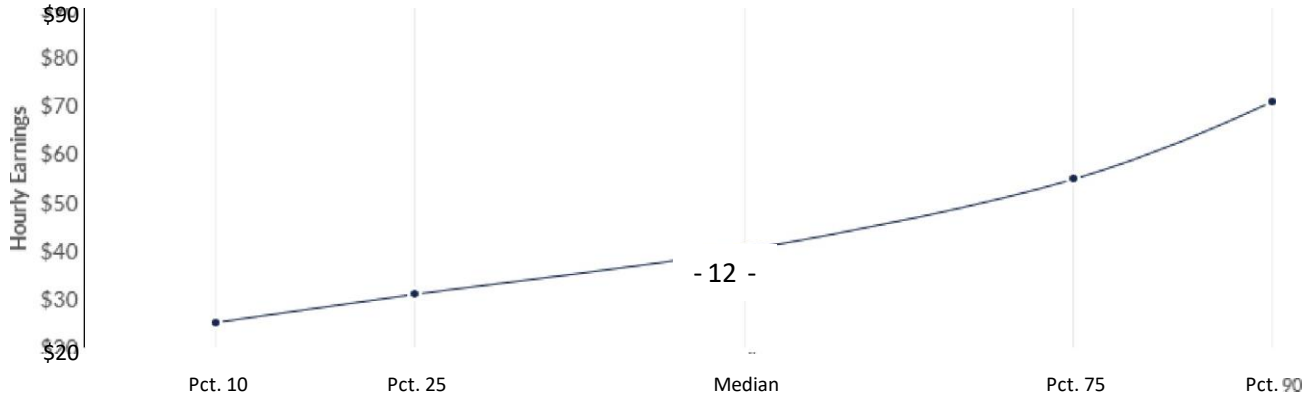
2,017	-2.600	$39.99/hr
Jobs (2018) 46% above National average	0/0 Change (2018-2024) Nation: +6.7%	Median Hourly Earnings Nation: $34.55/hr

2,017	1,964	-53	— 2.600
2018 Jobs	2024 Jobs	Change (2018-2024)	0/0 Change (2018-2024)



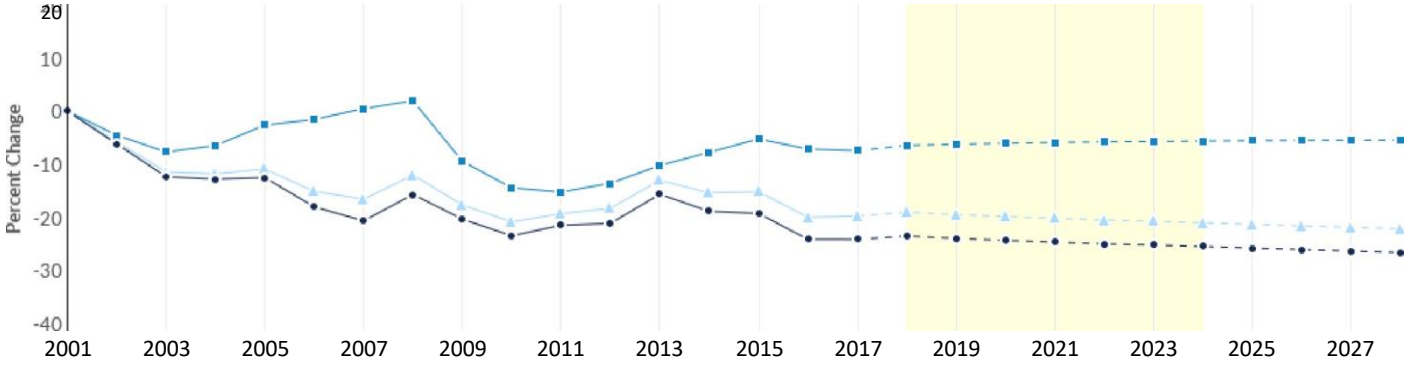
Occupation	2018 Jobs	2024 Jobs	Change	% Change
Mechanical Engineers (17-2141)	1 ,421	1,376	-45	
Architectural and Civil Drafters (17-3011)	282	282		00/0
Electrical and Electronics Drafters (17-3012)	110	108	-2	-2%
Mechanical Drafters (17-3013)	172	168	-4	-2%
Drafters, All Other (17-3019)	31	31		00/0

30.79/hr	$39.99/hr	$54.68/hr
25th Percentile Earnings	Median Earnings	75th Percentile Earnings



Occupation	25th Percentile Earnings	Median Earnings	75th Percentile Earnings
Mechanical Engineers (17-2141)	$35.35	$45.35	$62.50
Architectural and Civil Drafters (17-3011)	$22.86	$28.97	$35.64
Electrical and Electronics Drafters (17-3012)	$26.49	$36.24	$44.47
Mechanical Drafters (17-3013)	$20.88	$27.87	$36.52
Drafters, All Other (17-3019)	$18.70	$25.58	$32.87

Regional Trends



	Region	2018 Jobs	2024 Jobs	Change	Change
	Region	2,017			
	Los Angeles MSA	17,751	1,964	-53	-2.6%
A	ECC Environmental Scan (7.5 mile radius)	2,667			
2,602			-65	-2.4%	

Regional Breakdown

ZIP	2024 Jobs
El Segundo, CA 90245 (in Los Angeles county)	668
Hawthorne, CA 90250 (in Los Angeles county)	235
Torrance, CA 90505 (in Los Angeles county)	179
Torrance, CA 90501 (in Los Angeles county)	154
Gardena, CA 90248 (in Los Angeles county)	141

Occupational Programs

4	30	155
Programs (2017)	Completions (2017)	Openings (2017)

CIP Code	Program	Completions (2017)
04.0901	Architectural Technology/Technician	19
15.1301	Drafting and Design Technology/Technician, General	11
15.1302	CAD/CADD Drafting and/or Design Technology/Technician	
15.1303	Architectural Drafting and Architectural CAD/CADD	

Industries Employing ECC Computer Aided Design/Drafting

Industry	Occupation Group Jobs in Industry (2018)	% of Occupation Group in Industry (2018)	% of Total Jobs in Industry (2018)
Aircraft Manufacturing	285	14.2%	2.3%
Guided Missile and Space Vehicle Manufacturing	241	12.0%	2.8%
Engineering Services	209	10.3%	10.7%
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	194	9.6%	2.6%
Other Aircraft Parts and Auxiliary Equipment Manufacturing	158	7.9%	2.8%

Appendix A - Regions

Code	Description
90245	El Segundo, CA (in Los Angeles county)
90247	Gardena, CA (in Los Angeles county)
90248	Gardena, CA (in Los Angeles county)
90249	Gardena, CA (in Los Angeles county)
90250	Hawthorne, CA (in Los Angeles county)
90251	Hawthorne, CA (in Los Angeles county)
90260	Lawndale, CA (in Los Angeles county)
90261	Lawndale, CA (in Los Angeles county)
90266	Manhattan Beach, CA (in Los Angeles county)
90267	Manhattan Beach, CA (in Los Angeles county)

90274	Palos Verdes Peninsula, CA (in Los Angeles county)
90275	Rancho Palos Verdes, CA (in Los Angeles county)
90277	Redondo Beach, CA (in Los Angeles county)
90301	Redondo Beach, CA (in Los Angeles county) Inglewood, CA (in Los Angeles county)
90302	Inglewood, CA (in Los Angeles county)
90303	Inglewood, CA (in Los Angeles county)
90304	Inglewood, CA (in Los Angeles county)
90305	Inglewood, CA (in Los Angeles county)
90306	Inglewood, CA (in Los Angeles county)
90307	Inglewood, CA (in Los Angeles county)
90308	Inglewood, CA (in Los Angeles county)
90309	Inglewood, CA (in Los Angeles county)
90310	Inglewood, CA (in Los Angeles county)
90312	Inglewood, CA (in Los Angeles county)
90501	Torrance, CA (in Los Angeles county)
90502	Torrance, CA (in Los Angeles county)
90503	Torrance, CA (in Los Angeles county)
90504	Torrance, CA (in Los Angeles county)
90505	Torrance, CA (in Los Angeles county)
90506	Torrance, CA (in Los Angeles county)
90507	Torrance, CA (in Los Angeles county)
90508	Torrance, CA (in Los Angeles county)
90509	Torrance, CA (in Los Angeles county)

Appendix B - Data Sources and Calculations

Location Quotient

Location quotient (IQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region unique in comparison to the national average.

Occupation Data

Emsi occupation employment data are based on final Emsi industry data and final Emsi staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level Emsi earnings by industry.

Institution Data

The institution data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

State Data Sources

This report uses state data from the following agencies: California Labor Market Information Department