PROGRAM REVIEW

COMPUTER AIDED DESIGN DRAFTING

2016

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1. Overview of the Program

a. Description of Program

The Computer Aided Design/Drafting (CADD) Program reflects the best intentions of the Industry and Technology Division, and El Camino College, in that it makes a positive difference in people's lives, supports local Industry requirements, and promotes student learning and success using the latest technologies and resources.

CADD software is used to design, engineer, test, and manufacture everything that is man-made; in the Automotive, Aerospace, and Product Design Industries; and also crosses-over many technology/business boundaries.   We effectively collaborate with the MTT, Architecture, Art, and IT departments. Student learning is supported and advanced by the latest software and hardware. This includes 3D printing and rapid prototyping of designs.

The CADD department predominantly serves the South Bay which encompasses a population of almost one   million residents and is home to one of the largest manufacturing bases in the country. Communities, employers, and academic institutions expect trained and qualified technology personnel with the skills required to make a positive   impact on the local economy. We work together with our industry partners to ensure the effective education of our students. The CADD department at El Camino is well recognized as the 'go-to' source for these necessary job skills.

We accomplish this by focusing on (2) main types of students:

1. Traditional students earning a degree, certificate or transferring to other academic institutions

2. Non-traditional students from Industry learning new technologies and processes (retraining/recertification)

    This approach has created a high-achieving and diverse student body that represents the best of our community. Ultimately, our goal is to immerse all of our students in the development of the high tech skills needed for success in higher education and employment opportunities.

The CADD department prepares students for employment and advancement in career fields utilizing computer aided design software. By completing the degree or certificate requirements; the student will gain proficiency in sketching, CADD fundamentals, three-dimensional design (3D) modeling design processes, and geometric dimensioning and tolerances (GD&T). Competencies are assessed regularly by student performance using industry standard, state-of-the-art computer hardware and software.

Students completing the program may expect to enter industry as CADD drafters or modelers in mechanical design, aerospace, automotive, or other related fields. Particular strengths of the program include its highly experienced faculty. In fact, several of our instructors have recent, relevant work experience in the industry within our community. To empower student learning, we focus on the use of CATIA (a world-class, fully integrated computer-aided Design, Manufacturing and Engineering (CAD/CAM/CAE) software package that is widely used in local industry including Boeing, Northrop-Grumman, Gulfstream, and Tesla); and we utilize AutoCAD; the world's most popular CAD software.

The program has served an annual enrollment of approximately five hundred students for the last four years; 2011 thru 2015, with success rates of seventy five to eighty percent.

b. Degrees and Certificates

ASSOCIATE IN SCIENCE DEGREE AND CERTIFICATES

ASSOCIATE IN SCIENCE DEGREE

El Camino College Major Requirements

At least 50% of the major requirements for the Associate in Science Degree must be completed at El Camino College.

Computer Aided Design/Drafting 5, 7 (formerly10abcd), 28, 31, 32, 33, 37, 43, 45

One course from:

Electronics and Computer Hardware Technology 11, 22, Machine Tool Technology 16, 46, 101,Welding 15, Art 141, 144, Computer Information Systems 13

Total Units: 26.5-27.5

CERTIFICATE OF ACHIEVEMENT

A Certificate of Achievement will be granted upon completion of the courses listed below.

At least 50% of the courses required for the Certificate of Achievement must be completed at El Camino College.

Computer Aided Design/Drafting 5, 7 (formerly10abcd), 28, 31, 32, 33, 37, 43, 45

One course from:

Electronics and Computer Hardware Technology 11, 22, Machine Tool Technology 16, 46, 101, Welding 15, Art 141, 144, Computer Information Systems 13

Total Units: 26.5-27.5

CERTIFICATE OF ACCOMPLISHMENT

A Certificate of Accomplishment will be granted upon completion of the courses listed below.

AutoCAD Mechanical Drafting Trainee:

Computer Aided Design/Drafting 5, 7 (formerly 10abcd)

Total Units: 6

c.   Program alignment with ECC strategic initiatives. (see appendix)

The following table shows how the CADD program is aligned with the mission statement and fulfills El Camino College Strategic Initiatives.	
Strategic Initiatives	Computer Aided Design Drafting Department
A: Enhance teaching to support student learning using a variety of instructional methods and services.	The new ITEC Building opened in 2015; and provided improvement in existing classrooms, laboratories, and facilities. The classrooms and labs incorporate the latest technologies. The department offers (2) online classes along with traditional classes for student unable to use our facilities
B: Strengthen quality educational and support services to promote student success.	Local Companies participate in the Advisory Committee meetings. Recommendations are evaluated and used to improve student success in terms of program completions and in employment prospects. Local employers increasingly contact us for Interns or workers.
C: Foster a positive learning environment and sense of community and cooperation through an effective process of collaboration and collegial consultation	Students in CADD 43 classes work in teams, which teaches them collaboration, team work, and cooperation. CADD collaborates with the Machine Tool Technology department (MTT) to initiate students into "real world" 3d printing and design process experience.

D: Develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the workforce training and economic development needs of the community	Local Companies participate in the Advisory Committee meetings. Recommendations are evaluated and used to improve student success in terms of program completions and in employment prospects. Local employers increasingly contact us for Interns or workers. Proximity to Northrop, Boeing, Space X, and Tesla, may lead to opportunities to collaborate with them in the near future.
E: Improve processes, programs, and services through the effective use of assessment program review, planning, and resource allocation.	The department reviewed and added three SLOs for each course in the program. Assessments were completed on courses scheduled for this year. The assessment, program review, planning, and resource allocation are in a state of continuous improvement. Program review, SLO development, and plan builder continue to evolve.
F: Support facility and technology improvements to meet the needs of students, employees, and the community.	The ITEC Complex in Spring of 2015. The move from the existing 50 years old Industry and Tech Building; provides improvement in existing classrooms, laboratories, and facilities that reflect "State-of-the-art" refinements to students, supported industries, and the local community.
G: Promote processes and policies that move the College toward sustainable, environmentally sensitive practices	We promote processes and policies that move the College toward sustainable, environmentally sensitive practices. The new Lecture rooms provide a modern "Smart" command control center. Labs have been designed with automatic lighting controls and automatic sprinkler systems for limited fire suppression.

Status of previous recommendations (2012)

1.   Upgrading equipment and software is an ongoing need. The CADD program must be able to consistently provide training using the proper tools that our advisory committee and industry recommends.

     Priority: This need is ongoing and will always be an issue with this program.

     Cost: Software - $12-15 k / year

                Hardware - Market Price

     Status: We have a new Building & Labs (ITEC). Our computers are running applicable software versions comparable to Industry standard.

2.   Hire additional part-time faculty to support the program as needed. An additional full-time faculty member is projected in the 1-2 year time-frame.

     Priority: This need is also ongoing but particularly urgent at this time due to the impending retirement of our senior full-time faculty member (leaving only one full-time instructor) and the increasing age of our few remaining part-timers.

     Cost: Full time - $70-100 k / year

              Part time – variable

     Status: We have lost a full time faculty member to retirement (2015); and have yet to hire a new Full time Faculty member. We have also lost a part time faculty member and have potential retirement issues with 3 other part time faculty members.

3.   Ongoing computer training for all instructors in the CADD program is necessary to keep up with industry. Also, as curriculum expands to cover new technology, faculty will need to develop curriculum in multiple formats to match industry demand. Additional formal training should be offered to compose and direct more courses online.

     Priority: This, too, remains an ongoing need and has taken on a new urgency due to looming major changes to our software (CATIA V6 and possible inclusion of Solidworks courses in the program).

     Cost: Training - $1500- $2000/40hrs variable

     Status: Ongoing; SolidWorks now taught in CADD 28 class

4. Open Technical Arts Building labs Monday - Saturday 8am- 5pm, and employ student assistants to manage the labs.

Cost: Variable

Status: Ongoing; This is still very desirable, and would provide our students with much-needed opportunities for additional practice and skill building

2.   <u>Analysis of Research Data</u>

a. Annual Program Participation

Program Participation (4-year Trend)
CADD
Years: 2010-11 to 2013-14

	2011-12	2012-13	2013-14	2014-15	4 Yr Average
Annual Enrollment	526	499	544	485	514

Annual Program Participation

Year	Annual Sections	Annual Enrollment
2011-12	23	526
2012-13	22	499
2013-14	23	544
2014-15	22	485

Program Participation (4-year Trend)
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Annual Program Participation

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2011-12	23	526
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2013-14	23	544
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b. Course Grade Distribution , Success, and Retention

Grade Distribution, Success, and Retention
CADD
Fall

Program					Preliminary Success Standard	###			
Session	Fall				5 year Success Average	###			
Do Not select more than one term or Program.					5 year Success Minimum	###			

Year	COURSE	Method	Weeks	Grade 'A'	'B'	'C'	'P'	'D'	'F'	'NP'	Inc P	Inc NF	'DR'	'W'	Total	Succ.	Reten.
2011	CADD-10AB	Distance	16	8	3	-	-	-	-	-	-	-	2	2	13	84.6%	84.6%
		Lecture	16	10	4	1	-	-	5	-	-	-	-	1	21	71.4%	95.2%
	CADD-31AB	Distance	16	7	-	-	-	-	1	-	-	-	-	3	11	63.6%	72.7%
		Lecture	8	20	2	4	-	-	6	-	-	-	3	11	43	60.5%	74.4%
	CADD-32AE	Lecture	8	27	2	2	-	-	1	-	-	-	7	3	35	88.6%	91.4%
	CADD-33AE	Lecture	8	15	1	2	-	-	-	-	-	-	2	-	18	####	####
	CADD-37AE	Lecture	8	17	3	2	-	-	-	-	-	-	5	3	25	88.0%	88.0%
	CADD-45	Lecture	16	22	2	-	-	-	1	-	-	-	-	2	27	88.9%	92.6%
	CADD-5	Lecture	16	29	7	6	-	5	11	-	-	-	1	5	63	66.7%	92.1%
2011 Total				155	24	17		5	25				20	30	##	76.6%	88.3%
2012	CADD-10AB	Distance	16	8	3	-	-	-	-	-	-	5	-	11	27	40.7%	59.3%
		Lecture	16	18	3	3	-	-	-	-	-	-	-	4	28	85.7%	85.7%
	CADD-31AB	Distance	16	7	1	-	-	1	8	-	-	-	-	4	21	38.1%	81.0%
		Lecture	8	28	-	4	-	1	3	-	-	-	-	6	42	76.2%	85.7%
	CADD-32AE	Lecture	8	14	-	3	-	-	2	-	-	-	-	1	20	85.0%	95.0%
	CADD-33AE	Lecture	8	17	1	1	-	-	1	-	-	-	-	-	20	95.0%	####
	CADD-37AE	Lecture	8	12	3	1	-	-	1	-	-	2	-	-	18	84.2%	####
	CADD-45	Lecture	16	9	7	2	-	-	-	-	-	3	-	7	28	64.3%	75.0%
	CADD-5	Lecture	16	26	5	7	-	-	10	-	-	-	-	9	57	66.7%	84.2%
2012 Total				139	23	21		2	25			10		42	##	69.8%	84.0%
2013	CADD-28	Lecture	16	12	-	-	-	-	4	-	-	-	-	1	17	70.6%	94.1%
	CADD-31	Distance	16	4	-	-	-	-	5	-	-	-	-	10	19	21.1%	47.4%
		Lecture	8	28	4	2	-	-	1	-	-	-	-	10	45	75.6%	77.8%
	CADD-32	Lecture	8	19	2	-	-	-	-	-	-	-	-	2	23	91.3%	91.3%
	CADD-33	Lecture	8	19	2	1	-	-	-	-	-	-	-	1	23	95.7%	95.7%
	CADD-37	Lecture	8	12	3	3	-	-	-	-	-	-	-	1	19	94.7%	94.7%
	CADD-45	Lecture	16	23	2	1	-	-	3	-	-	-	-	4	33	78.8%	87.9%
	CADD-5	Lecture	16	36	9	6	-	4	11	-	-	-	-	9	75	68.0%	88.0%
	CADD-7	Distance	16	6	2	-	-	-	-	-	-	9	-	4	21	38.1%	81.0%
		Lecture	16	8	4	2	-	-	1	-	-	-	-	1	16	87.5%	93.8%
2013 Total				167	28	15		4	25			9		43	291	72.2%	85.2%
2014	CADD-28	Lecture	16	20	1	-	-	-	-	-	3	-	-	2	26	92.3%	92.3%
	CADD-31	Distance	16	5	-	1	-	-	4	-	-	-	-	13	23	26.1%	43.5%
		Lecture	8	20	4	2	-	-	1	-	-	7	-	6	40	65.0%	85.0%
	CADD-32	Lecture	8	8	4	-	-	-	-	-	-	-	-	5	17	70.6%	70.6%
	CADD-33	Lecture	8	15	4	1	-	-	-	-	-	-	-	2	22	90.9%	90.9%
	CADD-37	Lecture	8	17	4	-	-	-	-	-	-	-	-	4	25	84.0%	84.0%
	CADD-45	Lecture	16	7	8	5	-	-	5	-	-	-	-	3	28	71.4%	89.3%
	CADD-5	Lecture	16	22	14	5	-	4	1	-	-	1	-	6	53	77.4%	88.7%
	CADD-7	Distance	16	8	3	2	-	-	-	-	-	-	-	8	21	61.9%	61.9%
2014 Total				122	42	16		4	11		3	8		49	##	71.8%	80.8%

CADD
Spring

Program					Preliminary Success Standard	###			
Session	Spring				5 year Success Average	###			
Do Not select more than one term or Program.					5 year Success Minimum	###			

Year	COURSE	Method	Weeks	Grade 'A'	'B'	'C'	'P'	'D'	'F'	'NP'	Inc P	Inc NF	'DR'	'W'	Total	Succ.	Reten.
2012	CADD-10AB	Distance	16	3	-	1	-	1	-	-	-	-	1	7	12	33.3%	41.7%
		Lecture	16	8	7	3	-	-	3	-	-	-	-	7	28	64.3%	75.0%
	CADD-28AE	Lecture	16	14	3	1	-	-	1	-	-	-	1	2	21	85.7%	90.5%
	CADD-31AB	Distance	16	2	-	1	-	-	10	-	-	1	1	7	21	14.3%	66.7%
		Lecture	8	10	1	2	-	-	-	-	-	-	-	4	17	76.5%	76.5%
	CADD-32AE	Lecture	8	21	2	2	-	-	-	-	-	-	-	2	27	92.6%	92.6%
	CADD-37AE	Lecture	8	15	1	2	-	-	-	-	-	-	1	1	19	94.7%	94.7%
	CADD-43	Lecture	16	20	2	-	-	-	3	-	-	1	-	-	26	84.6%	####
	CADD-5	Lecture	16	28	11	7	-	1	14	-	-	-	1	2	63	73.0%	95.2%
2012 Total				121	27	19		2	31			2	5	32	##	71.4%	86.3%
2013	CADD-10AB	Distance	16	7	-	1	-	-	-	-	-	-	-	8	16	50.0%	50.0%
		Lecture	16	7	8	-	-	-	4	-	-	-	-	4	23	65.2%	82.6%
	CADD-28AE	Lecture	16	17	2	1	-	-	3	-	-	-	-	3	26	76.9%	88.5%
	CADD-31AB	Distance	16	4	-	-	-	-	9	-	-	-	-	8	21	19.0%	61.9%
		Lecture	8	28	1	-	-	-	4	-	-	1	-	6	40	72.5%	85.0%
	CADD-32AE	Lecture	8	20	2	-	-	-	2	-	-	-	-	3	27	81.5%	88.9%
	CADD-37AE	Lecture	8	14	-	-	-	-	1	-	-	-	-	3	18	77.8%	83.3%
	CADD-43	Lecture	16	6	1	-	-	-	-	-	-	2	-	2	11	63.6%	81.8%
	CADD-5	Lecture	16	27	11	2	-	-	3	-	-	-	-	10	53	75.5%	81.1%
2013 Total				130	25	4			26			3		47	##	67.7%	80.0%
2014	CADD-28	Lecture	16	17	-	1	-	-	2	-	-	-	-	1	21	85.7%	95.2%
	CADD-31	Distance	16	7	1	1	-	-	5	-	-	-	-	10	24	37.5%	58.3%
		Lecture	8	25	5	1	-	-	-	-	-	7	-	3	41	75.6%	92.7%
	CADD-32	Lecture	8	19	6	-	-	-	1	-	-	-	-	3	29	86.2%	89.7%
	CADD-37	Lecture	8	11	6	-	-	-	-	-	-	-	-	2	19	89.5%	89.5%
	CADD-43	Lecture	16	16	9	1	-	-	1	-	-	-	-	7	34	76.5%	79.4%
	CADD-5	Lecture	16	33	9	4	-	3	1	-	-	3	-	2	55	83.6%	96.4%
	CADD-7	Distance	16	7	-	-	-	-	-	-	-	1	-	9	17	41.2%	47.1%
		Lecture	16	7	3	-	-	-	2	-	-	-	-	-	12	83.3%	100.0%
2014 Total				142	39	8		3	12			11		37	##	75.0%	85.3%
2015	CADD-28	Lecture	16	17	-	-	-	-	-	-	1	-	-	2	20	90.0%	90.0%
	CADD-31	Distance	16	4	-	-	-	-	6	-	-	-	-	7	17	23.5%	58.8%
		Lecture	8	20	5	3	-	-	-	-	-	6	-	4	38	73.7%	89.5%
	CADD-32	Lecture	8	19	8	-	-	-	-	-	-	-	-	4	31	87.1%	87.1%
	CADD-37	Lecture	8	9	2	3	-	1	-	-	-	-	-	2	17	82.4%	88.2%
	CADD-43	Lecture	16	7	15	1	-	-	-	-	-	-	-	6	29	79.3%	79.3%
	CADD-5	Lecture	16	31	9	4	-	2	1	-	-	4	-	1	52	84.6%	98.1%
	CADD-7	Distance	16	-	-	-	-	-	-	-	-	-	-	8	8	0.0%	0.0%
		Lecture	16	13	3	-	-	-	-	-	-	-	-	1	17	94.1%	94.1%
2015 Total				120	42	11		3	7		1	10		35	##	76.0%	84.7%

c. Section Fill Rates

Fall Section Fill Rates

Percent of Seats Filled	2011	2012	2013	2014
	89.7%	89.5%	94.8%	98.8%
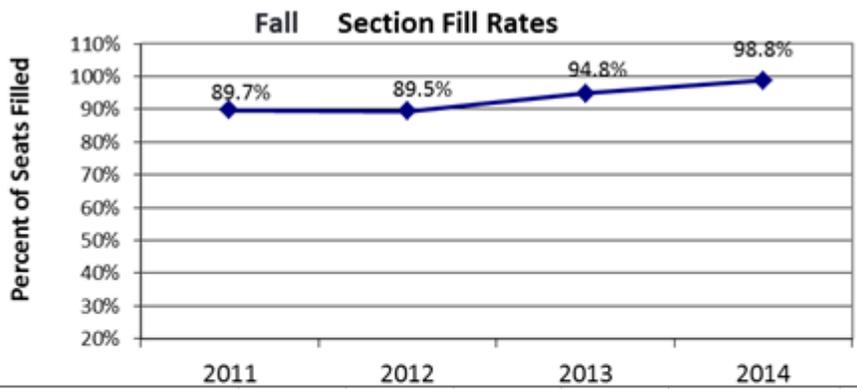
Enrollment by Time of Day

Fall Term	2011	2012	2013	2014
Day	17.8%	22.1%	17.5%	11.0%
Night	69.3%	59.7%	68.7%	71.8%
Weekend/Unknown	12.9%	18.3%	13.7%	17.3%

Spring Section Fill Rates

Percent of Seats Filled	2012	2013	2014	2015
	88.5%	87.4%	102.0%	92.7%
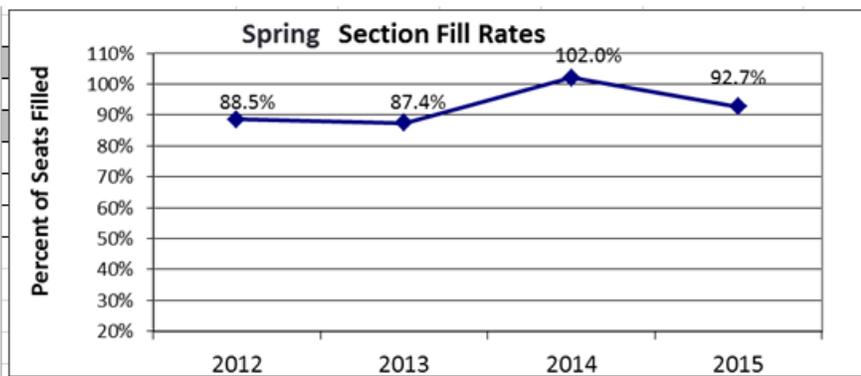
Enrollment by Time of Day

Spring Term	2012	2013	2014	2015
Day	24.7%	21.2%	16.6%	17.4%
Night	60.7%	62.7%	66.8%	68.0%
Weekend/Unknown	14.6%	16.1%	16.6%	14.5%

d. Term Head Counts

Will show 0.0% if you did not select Program *AND* Term on the Academics Tab

	Fall				ECC Student Populat	District Boundary Populatio
			Term			
		2011	2012	2013	2014	Fall 2014	2010 Census
Term Headcount		196	196	220	180	24,263	556,400
Gender F		15.3%	17.3%	20.0%	22.2%	51.6%	51.0%
M		84.2%	82.7%	80.0%	77.8%	48.4%	49.0%
Ethnicity	African-American	15.3%	13.8%	14.1%	11.1%	16.1%	15.1%
	Amer. Ind. or Alask. Nativ	0.0%	0.0%	0.9%	0.0%	0.1%	0.2%
	Asian	21.4%	18.9%	19.1%	19.4%	15.1%	10.6%
	Latino	39.3%	39.3%	40.9%	43.3%	48.5%	34.5%
	Pacific Islander	0.5%	0.0%	0.0%	0.6%	0.5%	0.5%
	White	18.4%	24.0%	20.5%	20.0%	10.6%	32.8%
	Two or More	2.6%	2.0%	3.2%	3.3%	4.4%	2.9%
	Unknown or Decline	2.6%	2.0%	1.4%	2.2%	0.7%	0.4%
Age/ Age Group	<17	0.0%	0.0%	0.0%	0.0%	1.8%	24.2%
	17	0.5%	1.0%	0.0%	0.0%	2.2%	
	18	7.1%	2.6%	2.3%	2.2%	12.4%	2.5%
	19	10.2%	8.2%	6.4%	4.4%	14.0%	
	20	4.1%	7.7%	5.5%	4.4%	12.6%	1.2%
	21	5.6%	7.7%	4.5%	7.2%	9.9%	1.2%
	22	4.1%	2.0%	7.7%	7.8%	7.5%	3.9%
	23	5.1%	4.1%	5.0%	10.6%	5.6%	
	24	4.6%	5.6%	8.2%	6.1%	4.7%	
	25-29	14.3%	17.9%	18.6%	20.6%	12.0%	7.4%
	30-39	23.0%	15.8%	17.3%	17.8%	9.9%	14.9%
	40-49	8.2%	13.8%	13.2%	8.3%	3.0%	15.9%
	50-64	10.7%	11.2%	8.6%	9.4%	3.0%	18.1%
	65+	2.6%	2.6%	2.7%	1.1%	0.7%	10.6%
Class Lo	Full-time	19.4%	17.3%	21.4%	22.2%	34.5%	
	Part-time	69.4%	75.5%	68.6%	68.3%	65.0%	
Academic Level	College degree	26.5%	28.6%	30.5%	32.2%	11.7%	
	HS Grad	69.4%	66.8%	64.5%	62.2%	82.3%	
	Not a HS Grad	1.5%	1.0%	0.5%	0.0%	0.3%	
	K-12 Special Admit	0.0%	0.5%	0.0%	0.0%	2.3%	
	Unknown	2.6%	3.1%	4.5%	5.6%	3.4%	
Educational Goal	Intend to Transfer	25.5%	22.4%	25.5%	19.4%	31.5%	
	Degree/Certificate Only	5.1%	3.1%	4.5%	5.6%	3.5%	
	Retrain/recertif.	17.3%	10.2%	9.1%	10.6%	3.2%	
	Basic Skills/GED	5.1%	3.6%	3.2%	5.6%	5.7%	
	Enrichment	2.6%	5.6%	6.4%	5.0%	2.2%	
	Undecided	14.3%	14.8%	11.8%	13.9%	15.0%	
	Unstated	30.1%	40.3%	39.5%	40.0%	38.0%	

CADD
Spring
Will show 0.0% if you did not select Program *AND* Term on the Academics Tab

	Fall				ECC Student Populat Spring 201	District Boundary Populatio 2010 Census
		Term				
	2012	**2013**	**2014**	**2015**		
Term Headcount	200	187	198	184	22,667	556,400
Gender F	19.5%	21.9%	19.2%	17.4%	51.7%	51.0%
M	80.5%	78.1%	80.8%	82.6%	48.3%	49.0%
Ethnicity African-American	17.0%	12.3%	12.1%	7.1%	15.3%	15.1%
Amer. Ind. or Alask. Nativ	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Asian	15.0%	12.3%	24.2%	16.8%	15.1%	10.6%
Latino	39.0%	41.2%	43.9%	53.8%	50.0%	34.5%
Pacific Islander	0.0%	0.0%	0.0%	0.0%	0.5%	0.5%
White	22.0%	27.8%	16.7%	17.9%	10.8%	32.8%
Two or More	2.0%	4.8%	2.0%	3.3%	4.5%	2.9%
Unknown or Decline	5.0%	1.6%	1.0%	1.1%	0.7%	0.4%
Age/ Age Group <17	0.0%	0.0%	0.0%	0.0%	1.0%	24.2%
17	0.0%	0.0%	0.0%	0.0%	1.0%	
18	5.5%	5.3%	1.5%	2.7%	4.2%	2.5%
19	7.0%	6.4%	5.1%	5.4%	8.5%	
20	8.5%	9.6%	8.1%	11.4%	7.2%	1.2%
21	6.0%	7.0%	7.1%	4.9%	5.2%	1.2%
22	5.0%	7.0%	6.1%	6.5%	3.6%	3.8%
23	8.0%	5.3%	5.6%	8.7%	2.8%	
24	4.5%	5.9%	4.5%	7.1%	2.2%	
25-29	16.5%	17.6%	19.7%	15.8%	10.6%	7.4%
30-39	13.0%	14.4%	17.2%	17.9%	8.9%	14.9%
40-49	13.0%	8.6%	14.1%	7.1%	3.8%	15.9%
50-64	9.5%	10.7%	10.6%	11.4%	3.0%	18.1%
65+	3.5%	2.1%	0.5%	1.1%	0.7%	10.6%
Class Lo Full-time	16.0%	16.0%	19.7%	25.0%	32.6%	
Part-time	79.5%	74.9%	72.2%	66.3%	66.2%	
Academic Level College degree	24.0%	24.6%	33.8%	25.5%	11.6%	
HS Grad	72.5%	72.2%	60.1%	70.1%	82.3%	
Not a HS Grad	1.0%	0.5%	0.0%	0.0%	0.3%	
K-12 Special Admit	0.0%	0.0%	0.0%	0.0%	2.0%	
Unknown	2.5%	2.7%	6.1%	4.3%	3.7%	
Educational Goal Intend to Transfer	25.5%	19.3%	26.3%	26.6%	30.8%	
Degree/Certificate Only	4.0%	4.8%	5.1%	7.1%	3.7%	
Retrain/recertif.	15.0%	9.1%	10.1%	12.5%	3.3%	
Basic Skills/GED	4.5%	3.7%	6.1%	7.6%	5.3%	
Enrichment	5.5%	6.4%	6.6%	5.4%	2.3%	
Undecided	17.0%	19.8%	13.1%	15.2%	16.6%	
Unstated	28.5%	36.9%	32.8%	25.5%	38.0%	

Certificates Earned:

Year 2010 – 2

Year 2011 – 5

Year 2012 – 2

Year 2013 – 6

Year 2014 – 6

Degree Earned:

Year 2010 - 2

Year 2011 – 6

Year 2012 – 3

Year 2013 – 4

Year 2014 –10

Summary:

The CADD program's student population is older and more male than the overall campus population. Historically, the majority of our students are part-time due to their employment in local industry. Most are seeking to maintain currency with software tools and changing industry standards or to upgrade their skills. The rest of our students are seeking degrees, certificates or transfer credits to 4 year institutions.

Gender:

Approximately 80% of students who enroll in CADD courses are male. Women have made gains compared with past research

Ethnicity:

Approximately 1/3 of students in CADD courses are Latino followed by: White, Asian, and African America

Age Group:

Approximately 50% of CADD students in the last four years were adults (ages 25-50).

Time of Class:

Non Traditional (evening/weekend) students outnumbering Traditional (daytime students) by a 3/1 margin.

Academic Level:

70% of CADD students are high school graduates and 28% have earned a college degree.

Educational Goal:

Intent to transfer is most prevalent at 25% (discounting the statistics for unknown/undecided) followed by retraining/recertification at 15%

We also receive undecided students from other departments in I&T, and other community colleges and universities seeking Catia training due to its widespread use in the aerospace and automotive industries. We always encourage students to seek a Certificates of achievement or an AS degree to increase their knowledge base and employability.

3. Curriculum

Curriculum Table Timeline

COMPUTER AIDED DESIGN/DRAFTING CURRICULUM – 2012-2018						
COURSE	**2012-2013**	**2013-2014**	**2014-2015**	**2015-2016**	**2016-2017**	**2017-2018**
Computer Aided Design Drafting 5				Content Review		2 Year CTE Review
Computer Aided Design Drafting 7		Number Change From: CADD 10abcd To: CADD 7	From: AutoCAD To: Inventor Pro		2 Year CTE Review	
Computer Aided Design Drafting 28		From: CADD 28abcd To: CADD 28	From: Inventor Pro To: SolidWorks		2 Year CTE Review	
Computer Aided Design Drafting 31		From: CADD 31abcd To: CADD 31	2 Year CTE Review		2 Year CTE Review	
Computer Aided Design Drafting 32		From: CADD 32abcd To: CADD 32		2 Year CTE Review		2 Year CTE Review
Computer Aided Design Drafting 33		From: CADD 33abcd To: CADD 33		2 Year CTE Review		2 Year CTE Review
Computer Aided Design Drafting 37		From: CADD 37abcd To: CADD 37		2 Year CTE Review		2 Year CTE Review
Computer Aided Design Drafting 43			Course Review	Course Review Prerequisite Change		2 Year CTE Review
Computer Aided Design Drafting 45				2 Year CTE Review		2 Year CTE Review
Computer Aided Design Drafting 50		Inactivate				
Computer Aided Design Drafting 95				From: CADD 95abcd To: CADD 95		
Computer Aided Design Drafting 99			From: CADD 99abc To: CADD 99			

CADD 10abcd changed to CADD 7 Inventor Pro (software upgrade)

CADD 28 – changed to Solid Works (software upgrade)

CADD 43 – changed prerequisite (from 2D to 3D software knowledge)

All of our CADD classes were affected by a state/ECC mandate regarding "re-taking" classes previously attended (abcd). This has had a negative effect on the program. For the record; this mandate should not apply to the CADD program, as computer software changes at an accelerated rate and students need almost constant retraining in changes/upgrades. Student success relies on knowing current software.

CADD courses at the present time are consistent with current practice in industry. As the industry changes so should curriculum. With the advice of the advisory committee the CADD program curriculum will change in the future. Additional learning platforms (ex: online) will certainly be required with further advancements in Internet based tools.

4. Assessment and Student and Program Learning Outcomes (SLOs & PLOs)

INDUSTRY AND TECHNOLOGY
Institutional (ILO), Program (PLO), and Course (SLO) Alignment

Program: **Computer Aided Design/Drafting**	**Number of Courses:** 9	**Date Updated:** 09.18.2014	**Submitted by:** SueEllen Warren, ext. 4519 Renee Newell, ext. 3308

ILOs	**1. Critical Thinking** Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.	**2. Communication** Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.	**3. Community and Personal Development** Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their engagement in campus programs and services.	**4. Information Literacy** Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.

SLO-PLO-ILO ALIGNMENT NOTES:

Mark boxes with an 'X' if: SLO/PLO is a major focus or an important part of the course/program; direct instruction or some direct instruction is provided; students are evaluated multiple times (and possibly in various ways) throughout the course or are evaluated on the concepts once or twice within the course.

DO NOT mark with an 'X' if: SLO/PLO is a minor focus of the course/program and some instruction is given in the area but students are not formally evaluated on the concepts; or if the SLO/PLO is minimally or not at all part of the course/program.

PLOs	**PLO to ILO Alignment** *(Mark with an X)*			
	1	2	3	4
PLO #1 ASE Creating and Interpreting Engineering Drawings Upon completion of the Computer Aided/Design Drafting program, the student will be able to utilize CADD software to create and interpret engineering drawings at an industry entry skill level.	X			
PLO #2 Creating and Interpreting 3D CADD Models Upon completion of the Computer Aided/Design Drafting program, the student will be able to utilize CADD software to create 3D CADD models of detail parts and assemblies of various manufactured products and their components at an industry entry skill level.	X			
PLO #3 Product Development Upon Completion of the Computer Aided/Design Drafting program, the student will be able to function as a member of a product development team.	X			

SLOs	**SLO to PLO Alignment** *(Mark with an X)*			**COURSE to ILO Alignment** *FOR OFFICE USE ONLY*			
	P1	P2	P3	1	2	3	4
CADD 28 Parametric Solid Modeling and Assemblies: SLO #1 Multi-view Drawing - 3D Solid Model Given a fully dimensioned multi-view engineering drawing of a machined part, the student will be able to utilize the appropriate functions within the Inventor software to construct a 3Dsolid model of the part.		X					
CADD 28 Parametric Solid Modeling and Assemblies: SLO #2 3D Solid Model - Multi-view Drawing Given a 3D solid model of a simple machined part, the student will be able to utilize the appropriate functions within the Inventor software to create a fully-dimensioned multi-view engineering drawing of the part.		X		X			
CADD 28 Parametric Solid Modeling and Assemblies: SLO #3 Animating Assemblies Given a 3D solid model of a simple mechanism, the student will be able to utilize the appropriate functions within the Inventor software an animated simulation of the mechanism's function.		X					
CADD 31 Orientation to CATIA: SLO #1 Creating CATIA V5 Simple 3D Solid Models Given a fully dimensioned multi-view engineering drawing of a machined part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a 3D solid model of the part.		X					
CADD 31 Orientation to CATIA: SLO #2 Creating CATIA V5 Simple Engineering Drawings Given a 3D solid model of a simple machined part, the student will be able to utilize the appropriate functions within the CATIA software to create a fully dimensioned multi-view engineering drawing of the part.		X		X			
CADD 31 Orientation to CATIA: SLO #3 Creating CATIA V5 Simple Assembly Models Given a set of 3D solid models of the component parts of a simple assembly, the student will be able to utilize the appropriate functions within the CATIA software to create a fully constrained assembly model.		X					
CADD 32 Product Modeling with CATIA: SLO #1 3D Model and Engineering Drawing Given a fully dimensioned multi-view engineering drawing of a complex machined part, utilize the appropriate functions within the CATIA V5 software to construct a 3D solid model of the part, and engineering drawing of the product containing this component.		X					
CADD 32 Product Modeling with CATIA: SLO #2 Creating CATIA V5 Complex Engineering Drawings Given a 3D solid model of a complex machined part, the student will be able to utilize the appropriate functions within the CATIA software to create a fully dimensioned multi-view engineering drawing of the part.		X		X			
CADD 32 Product Modeling with CATIA: SLO #3 Creating CATIA V5 Complex Assembly Models Given a set of 3D solid models of the component parts of a complex assembly, the student will be able to utilize the appropriate functions within the CATIA software to create a fully constrained assembly model.		X					

SLOs	SLO to PLO Alignment (Mark with an X)			COURSE to ILO Alignment *FOR OFFICE USE ONLY*			
	P1	P2	P3	1	2	3	4
CADD 33 Analyses and Simulations with CATIA: SLO #1 Knowledgeware and Generative Sheet Metal Functions Given sufficient product definition information, the student will be able to create tabulated models and flat pattern models utilizing the Knowledgeware and Generative Sheet Metal functions within the CATIA V5 software.			X				
CADD 33 Analyses and Simulations with CATIA: SLO #2 Kinematic Simulations Given a CATIA Product model of a simple mechanism, the student will be able to create kinematic simulations utilizing the Kinematics Simulation function within the CATIA V5 software.			X	X			
CADD 33 Analyses and Simulations with CATIA: SLO #3 Stress Analysis Given a CATIA Product model of a simple mechanism, the student will be able to perform stress analyses utilizing Stress Analysis functions within the CATIA V5 software.			X				
CADD 37 Advanced CATIA Functions: SLO #1 3D Wireframe Modeling Given a fully-dimensioned multi-view engineering drawing of a machined part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a 3D wireframe model of the part.		X					
CADD 37 Advanced CATIA Functions: SLO #2 Utilizing Surfacing Functions Given a fully dimensioned multi-view engineering drawing of a complex molded part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a 3D surface model of the part.		X		X			
CADD 37 Advanced CATIA Functions: SLO #3 Joining Surfaces Given a 3D surface model of two separate surfaces of a complex molded part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a third surface blending the original two. The new surface will be tangent continuous with both of the original surfaces.		X					
CADD 43 Design Process and Concepts: SLO #1 Design Team Given sufficient design requirement definition, the student shall be able to plan, sketch and create complete engineering drawing packages of sample products work individually as well as functioning effectively as a member of a design team.			X				
CADD 43 Design Process and Concepts: SLO #2 Product Definition Packages Given sufficient design requirement definition, the student will be able to plan, sketch and create complete two dimensional engineering drawing packages of sample products.			X	X			
CADD 43 Design Process and Concepts: SLO #3 Design Team Given sufficient task definition, the student will be able to function as a member of a design team charged with planning and creating a complete two dimensional engineering drawing package of a simple product.			X				

SLOs	SLO to PLO Alignment (Mark with an X)			COURSE to ILO Alignment *FOR OFFICE USE ONLY*			
	P1	P2	P3	1	2	3	4
CADD 45 Geometric Dimensioning and Tolerancing: SLO #1 Detecting Errors and Omissions Given sample engineering drawing whose dimensioning and tolerancing is done with Geometric Dimensioning and Tolerancing, the student will be able to point out errors and omissions in the application of dimensions and tolerances.	X						
CADD 45 Geometric Dimensioning and Tolerancing: SLO #2 Revising Incomplete Drawings Given an incomplete sample engineering drawing, the student will be able to revise the drawing to completely specify desired geometry and permissible variation of geometric characteristics utilizing appropriate symbology per the ASME Y14.5 Standard.	X			X			
CADD 45 Geometric Dimensioning and Tolerancing: SLO #3 Applying Geometric Controls Given a sample engineering drawing of a machined part without dimensioning and tolerancing and a description of the part's function, the student will be able to correctly apply dimensions, tolerances and datum identifiers.	X						
CADD 5 Introduction to Mechanical Drafting: SLO #1 Creating Dimensioned Orthographic Drawings Given sufficient product definition information of a simple machined part, the student will be able to utilize the AutoCad software to produce a dimensioned orthographic drawing of the item.	X						
CADD 5 Introduction to Mechanical Drafting: SLO #2 Creating Missing Orthographic Views Given an incomplete engineering drawing of a simple machined part, the student will be able to utilize the AutoCAD software to produce the missing views in standard 3rd angle orthographic projection.	X			X			
CADD 5 Introduction to Mechanical Drafting: SLO #3 Working From Isometric Views Given an isometric drawing of a simple machined part, the student will be able to utilize the AutoCAD software to produce front, top and right side views in standard 3rd angle orthographic projection.	X						
CADD 7 Wireframe with Surfaces, Solid Modeling and Assemblies: SLO #1 Creating Simple Machined Part-3D Solid Model Given sufficient product definition information of a simple machined part, the student will be able to utilize the AutoCad software to produce a 3D solid model of the item.	X						
CADD 7 Wireframe with Surfaces, Solid Modeling and Assemblies: SLO #2 Modifying Simple Machined Part-3D Solid Model Given a 3D solid model of a simple machined part and a dimensioned drawing defining necessary changes, the student will be able to utilize the AutoCad software to modify the 3D solid model to conform to the new requirements.	X			X			
CADD 7 Wireframe with Surfaces, Solid Modeling and Assemblies: SLO #3 Creating Assembly Models Given sufficient product definition information of a mechanical assembly and its components, the student will be able to utilize the AutoCad software to create 3D solid models of the individual components and bring them together into an assembly model.	X						

SLO Timeline Worksheet

Division: Industry & Technology   Program: CADD   Program Review Date: _____ 2016

Directions: Use this worksheet to schedule assessments for each SLO Statement over the four-year timeline.
When complete, return to your facilitator by January 31 for input into TracDat.

Course and SLO #	Note if offered only in FA/SU/SP	SP 2014	SU 2014	FA 2014	SP 2015	SU 2015	FA 2015	SP 2016	SU 2016	FA 2016	SP 2017	SU 2017	FA 2017	SP 2018	SU 2018	FA 2018
CADD PLO #1								Program			X					
CADD PLO #2								Review					X			
CADD PLO #3																X
CADD 5 SLO #1							X									
CADD 5 SLO#2											X					
CADD 5 SLO #3														X		
CADD 7 SLO #1							X									
CADD 7 SLO #2											X					
CADD 7 SLO #3														X		
CADD 28 SLO #1							X									
CADD 28 SLO #2											X					
CADD 28 SLO #3														X		
CADD 31 SLO #1				X												
CADD 31 SLO #2				X									X			
CADD 31 SLO #3				X												X
CADD 32 SLO #1					X											
CADD 32 SLO #2													X			
CADD 32 SLO #3																X
CADD 33 SLO #1							X									
CADD 33 SLO #2													X			
CADD 33 SLO #3																X

CADD timeline worksheet_2015-5.26.15.DG

Course and SLO #	Note if offered only in FA/SU/SP	SP 2014	SU 2014	FA 2014	SP 2015	SU 2015	FA 2015	SP 2016	SU 2016	FA 2016	SP 2017	SU 2017	FA 2017	SP 2018	SU 2018	FA 2018
CADD 37 SLO #1					X											
CADD 37 SLO #2												X				
CADD 37 SLO #3														X		
CADD 43 SLO #1					X											
CADD 43 SLO #2												X				
CADD 43 SLO #3														X		
CADD 45 SLO #1							X									
CADD 45 SLO #2													X			
CADD 45 SLO #3																X

SLOs & PLOs have been stated, re-stated, refined and massaged for the past 5 years. The current definitions appear to be working and integrated with student learning and achievement. The following student survey was very positive regarding preferred learning outcomes

5. <u>Analysis of Student Feedback</u>

CADD Program Review Student Survey

N=36   Fall 2016

Instructors in this program have helped me achieve my academic goals.

Response	Frequency	Percent	Mean: 4.67
Strongly Agree	28	77.78	
Agree	6	16.67	
Neither Agree nor Disagree	1	2.78	
Disagree	0	0.00	
Strongly Disagree	1	2.78	

Instructors in this program have helped me stay on track.

Response	Frequency	Percent	Mean: 4.64
Strongly Agree	27	75.00	
Agree	7	19.44	
Neither Agree nor Disagree	1	2.78	
Disagree	0	0.00	
Strongly Disagree	1	2.78	

Instructors in this program provide opportunities to actively participate in my classes.

Response	Frequency	Percent	Mean: 4.64
Strongly Agree	27	75.00	
Agree	7	19.44	
Neither Agree nor Disagree	1	2.78	
Disagree	0	0.00	
Strongly Disagree	1	2.78	

I have felt a sense of community within this program.

Response	Frequency	Percent	Mean: 4.50
Strongly Agree	25	69.44	
Agree	6	16.67	
Neither Agree nor Disagree	4	11.11	
Disagree	0	0.00	
Strongly Disagree	1	2.78	

Student contributions have been valued by instructors in this program.

Response	Frequency	Percent	Mean: 4.47
Strongly Agree	25	69.44	
Agree	6	16.67	
Neither Agree nor Disagree	3	8.33	
Disagree	1	2.78	
Strongly Disagree	1	2.78	

There is an appropriate range of courses offered in this program.

Response	Frequency	Percent	Mean: 4.44
Strongly Agree	22	61.11	
Agree	11	30.56	
Neither Agree nor Disagree	0	0.00	
Disagree	3	8.33	
Strongly Disagree	0	0.00	

Courses were scheduled on days and times that were convenient to me.

Response	Frequency	Percent	Mean: 4.42
Strongly Agree	24	66.67	
Agree	5	13.89	
Neither Agree nor Disagree	5	13.89	
Disagree	2	5.56	
Strongly Disagree	0	0.00	

I've been able to register for the classes I need within this program.

Response	Frequency	Percent	Mean: 4.75
Strongly Agree	28	77.78	
Agree	7	19.44	
Neither Agree nor Disagree	1	2.78	
Disagree	0	0.00	
Strongly Disagree	0	0.00	

The courses in this program have helped me meet my academic goals.

Response	Frequency	Percent	Mean: 4.64
Strongly Agree	27	75.00	
Agree	5	13.89	
Neither Agree nor Disagree	4	11.11	
Disagree	0	0.00	
Strongly Disagree	0	0.00	

There is a variety of extracurricular activities related to this program on campus.

Response	Frequency	Percent	Mean: 3.86
Strongly Agree	14	38.89	
Agree	6	16.67	
Neither Agree nor Disagree	14	38.89	
Disagree	1	2.78	
Strongly Disagree	1	2.78	

The library has the resources to help me succeed in this program.

Response	Frequency	Percent	Mean: 3.58
Strongly Agree	12	33.33	
Agree	4	11.11	
Neither Agree nor Disagree	15	41.67	
Disagree	3	8.33	
Strongly Disagree	2	5.56	

The buildings and classrooms used by this program are satisfactory.

Response	Frequency	Percent	Mean: 4.69
Strongly Agree	27	75.00	
Agree	7	19.44	
Neither Agree nor Disagree	2	5.56	
Disagree	0	0.00	
Strongly Disagree	0	0.00	

I am satisfied with the equipment (projectors, machinery, models, etc.) used in this program.

Response	Frequency	Percent	Mean: 4.44
Strongly Agree	22	61.11	
Agree	10	27.78	
Neither Agree nor Disagree	3	8.33	
Disagree	0	0.00	
Strongly Disagree	1	2.78	

I am satisfied with the computers and software used in this program.

Response	Frequency	Percent	Mean: 4.64
Strongly Agree	25	69.44	
Agree	9	25.00	
Neither Agree nor Disagree	2	5.56	
Disagree	0	0.00	
Strongly Disagree	0	0.00	

I am aware of the course outcomes - what I should be able to learn and what skills I should possess after completing courses in the program.

Response	Frequency	Percent	Mean: 4.78
Strongly Agree	29	80.56	
Agree	6	16.67	
Neither Agree nor Disagree	1	2.78	
Disagree	0	0.00	
Strongly Disagree	0	0.00	

This is the 1st student survey required for a program review, and the results are positive. Students indicate that understand course outcomes (SLO) and courses meet their academic goals. Also, they approve of the Instructor s and are pleased with the equipment and facilities.

6. __Facilities and Equipment__

We currently are in a very good situation regarding facilities and equipment. We have moved to a new facility in the ITEC building and have new lab space and computer equipment. We also have a "shared" lab relationship with several departments in the ITEC building. This maximizes lab efficiency, increases student satisfaction, and keeps overall ECC lab costs low.

We are thoroughly dependent on continuing the upgrading our technology (maintaining current software and suitable computers) to keep up with local industry specifications.

ECC IT and Support Services maintains our computers and software to the best of their ability.

Hopefully, all were at the Grand opening of the ITEC building, or will have an opportunity to tour the facility.

7. __Technology and Software__

The CADD department utilizes CATIA software as an advanced 3D modeling platform, and AutoCAD software as the basic 2D CAD learning platform, these softwares are the leaders in their respective classes worldwide, and have been employed at ECC for the last 20+ years. We have also added Solidworks 3D software since the last review.

The CADD program has a consistent pattern of upgrading software every 2-3 years to keep up with industry standards. Hardware is upgraded when funds are available.

The combined yearly cost for academic versions of our software is 12-15 thousand dollars**.**

8. __Staffing__

CURRENT FACULTY:

Full-Time

Douglas Glenn

Part-Time

Dan Valladares

Charlie Hamilton

Alan Bakalyar

Jorge Ulloa

9. <u>**Future Direction and Vision**</u>

The program understands the challenges of the current economic and employment environment, and has an idea of where we would like to head in the future. Many changes to the program will come by way of the advisory committee and the Engineering/CADD Industry recommendations. In order for our program to adapt and continue to be successful, we need to keep up with technological demands and adhere to the needs of local industry.

At present the data supplied to make decisions, is sufficient for our program. The advisory committee plays an important role in supplying the program Industry specific and academic information regarding any possible future changes in the department.

We see an increase in flexible course delivery including "online" and "as needed" information and presentation. We also see an increase in giving student's flexibility to access this technology via smart devices and the "cloud". Increase in an open lab environment and "on hand" tutors would also be helpful. All of these changes will be brought on by increases in technology, demographics, and student expectations.

ECC as a whole will need to address these issues; make funding available for this type of learning environment; and reduce the time needed to "green light" new classes, methods, and technologies.

These instructional innovations would increase student access, thereby allowing more practice to solidify skills.

Recommendations:

1. Hire a full-time faculty member to replace retired Professor Richard Hughes.

    Priority: This need is also ongoing but particularly urgent at this time due to the retirement of our senior full-time faculty member (leaving only one full-time instructor) and the increasing age of our few remaining part-timers.

    Cost: Full time - $80-100 k / year

2. Upgrading software and equipment is an ongoing need. The CADD department must be able to consistently provide training using the proper tools that our advisory committee and industry recommends.

    Priority: This need is ongoing and will always be necessary

    Cost: Software - $12-15 k / year

    Hardware - Market Price

3. Open ITEC CADD labs Monday - Friday 8am- 10pm, and employ student assistants and tutors to manage the labs.

Priority: This is extremely desirable. It would provide our students with much-needed opportunities for additional practice and skill building.

Cost: Part time – variable

10. **Prioritized Recommendations**

PRP

Recommendations	Cost Estimate	Strategic Initiatives
1. Full time Instructor	$70k/yr	
2. Upgrade Software	15k/yr	
3 Create "Open" Labs	Variable	

CAREER AND TECHNICAL EDUCATION – SUPPLEMENTAL QUESTIONS

CTE programs must conduct a full program review every 4 years. The full review includes answering these supplemental questions. Every two years (once between full 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, institutional data, and the provided CTE 2-year Program Review data to respond to the following questions:

1. **How strong is the occupational demand for the program? As you analyze demand over the past 5 years and projected demand for next 5 years, address state and local needs for the program.**

    The following categories of CADD related occupations were surveyed by ECC Institutional Research in Local, County, and State regions:

Drafting and Design Technology/Technician, General
Architectural Technology/Technician
Architectural Drafting and Architectural CAD/CADD
Architectural and Building Sciences/Technology
Civil Drafting and Civil Engineering CAD/CADD

    In all cases there was an increase in demand, since the "great recession" period of 2008 -2013.

    The outlook for the next five years is rising steadily across surveyed regions.

    The next 5 years will be crucial to our overall training effort to ensure that CADD workers will be able to upgrade their skills; and step into high paying technical positions in local industries.

    Other relevant data that may not be defined or collected, and may have an impact on statistics, involves occupations that require a CADD skill set. These include: engineer, machinist, inspector, analyst; and others   within the overall design/manufacturing population. Also, 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.

While the current recessionary environment fades; companies have increased hiring in engineering/technical disciplines. These are high paying jobs with the probability of upward mobility. Traditionally, aerospace companies have been the largest market; which covers OEM's (Boeing, Northrop Grumman) down to local contractors and suppliers. These companies have historically been important employers for California.

Also, due to the entrepreneurial, high tech environment in the State, there has been an emergence of "Maker" businesses armed with new technologies. As 3D printers, mills, and robotic arms becoming more affordable and main stream, CADD design and data management becomes increasingly interesting and necessary to a greater population of people and professions. (Medical, Dental, Recreation, etc)

The CADD department is prepared to train future generations of designers, engineers, and other technical personnel through traditional classes and online offerings.

2. **How does the program address needs that are not met by similar programs in the region?**

   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 most recent example is the closing of ITT tech schools.

   . 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 UC & CSU engineering students are advised to supplement their education with CADD classes, particularly basic Drafting and Catia,at El Camino. 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 the completion, success, and employment rates for the students?**
   Discuss any factors that may impact completion, success, and employment rates.

   Completions for 2012-13 were (3), and for 2013-14 were (4). Retention rate was 91%, and success rate was 81%.

   The employment rate equals 72.5%. This metric comes from the CTE Outcomes survey administered earlier this year among all students that completed 9+ CTE units. Institutional Research does not have data for individual programs.

   See attached information from Institutional Research for detailed data.

4. **Is there a licensure exam for students to work in their field of study, please list the exam and pass rate.**

The CADD department currently offers an Associate in Science Degree, Certificate of Achievement, and Certificate of Accomplishment (AutoCAD). Also, our training will allow students to complete certificates offered directly by CADD software vendors AutoDesk (AutoCAD, Inventor), and Dassault Systems (Catia, SolidWorks) as required by employers.

5. **Is the advisory committee satisfied with the level of preparation of program graduates.**

Our Advisory committee plays an important role in continuing to shape the CADD program. Our committee is made up of representatives from Gulfstream, Boeing, Northrop Grumman, 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.

Recently we upgraded all other application software to meet current Industry requirements.

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.

ADVISORY COMMITTEE:

2016 Advisory committee members:

Douglas Glenn – ECC
Daniel Valladares – ECC
Alan Bakalyar – Boeing
Elizabeth Sheets – Virgin Galactic
Justin Benites – Gulfstream
Sam Yim – Northrop Grumman
Scott Kelso – Kelso Construction
Christine Nguyen – Student

Advisory Committee Meeting Notes/Minutes 2016:

The meeting was held in the East dining room.

1. Welcome & Introductions: Douglas Glenn welcomed and introduced the members of the committee and thanked them for their attendance.

2. CADD program overview: The committee reviewed the checklist and agenda; and filled out the department survey questionnaire. The committee also reviewed and updated contact information.

3. The high growth in job fields was discussed, particularly for Aerospace and electric Vehicles, and the expectation that demand will continue in the near future.

4. The importance of students staying current with the latest CADD software was brought up. Important entry level skills would include: engineering design process, AutoCAD, Inventor, SolidWorks, and Catia skills.

5. The Committee then moved to the new ITEC bldg. and reviewed the labs equipment and software.

6. Meeting was adjourned at 7:30pm

El Camino College
Program Review: CADD 2010-2021

Overall Summary

- The summary figures below are generated from 5 Southern California counties (Los Angeles, Orange, Riverside, San Bernardino, and San Diego).

Key Figures 2010-2021:

8,007	10.0%	0.2%	$27.04/hr
Jobs estimate (2016)	**% Change (2010-2015)**	**% Change (2016-2021)**	**Median Hourly Earnings**
19% above National average	*Nation: 6.9%*	*Nation: 0.1%*	*Nation: $24.36/hr*

Occupational Growth Summary 2010-2021:

- In 2010, the number of jobs in Southern California was 7,092, which grew to 7,802 in 2015.
- This represented a change of 10.0% growth over that 5 year period
- It is expected in 2016, there will be 8,007 jobs available in Southern California counties, and projected to grow to 8,020 in 2021.
- This would represent only a small 0.2% growth over the next 5 year period (2016-2021).
- Below is a graphical representation of this trend from 2010-2015 and the projected trend between 2016-2021.
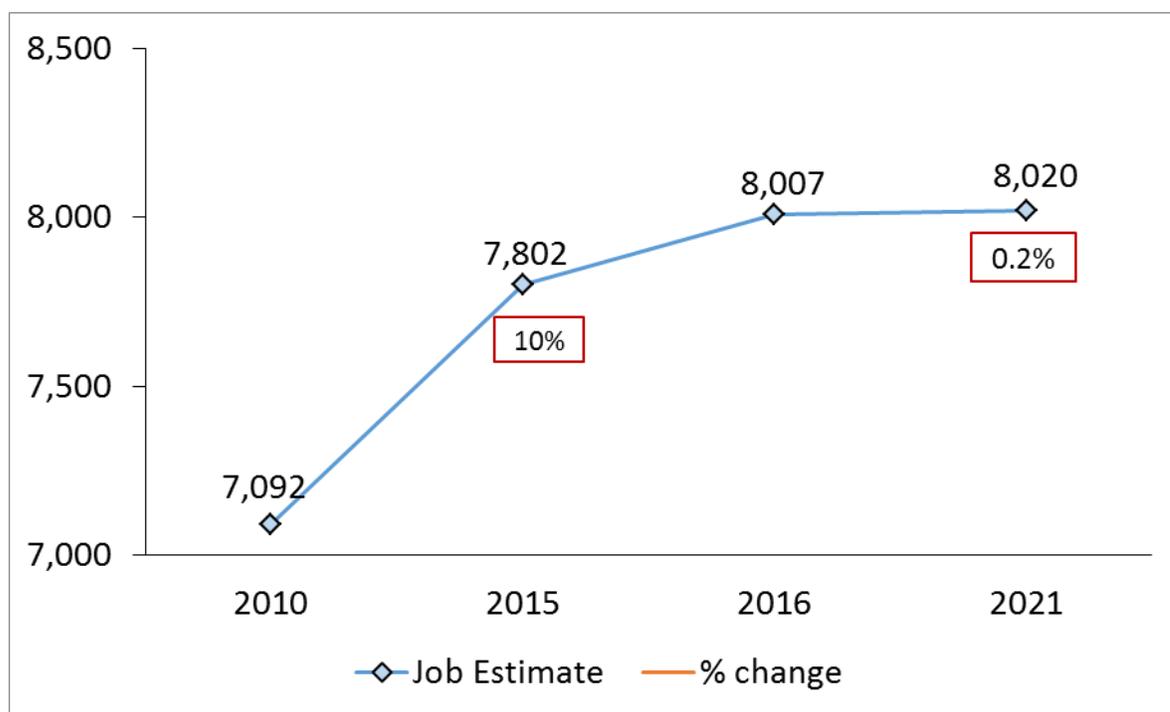
El Camino College Degree Completions Summary 2010-2015:

		2010-11	2011-12	2012-13	2013-14	2014-15
CADD	Architecture	22	16	13	10	13
	Computer Aided Design/Drafting	2	6	3	4	10

El Camino College Certificates Completions Summary 2010-2015:

		2010-11	2011-12	2012-13	2013-14	2014-15
CADD	Architecture	15	13	10	8	8
	Computer Aided Design/Drafting	4	5	2	6	6

Occupations shown in report include the categories listed:

Architectural and Civil Drafters (17-3011)

Drafters, All Other (17-3019)

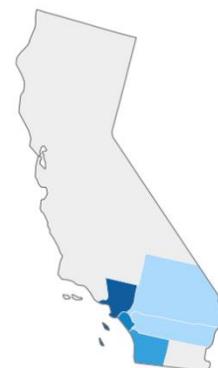## Regional Trends - Previous 5-years Occupation Demand (2010-2015)
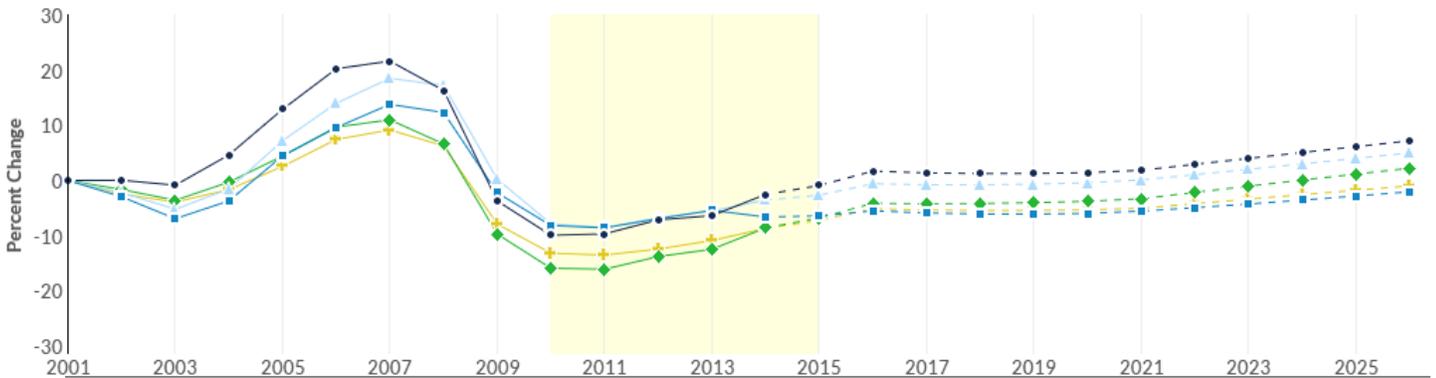
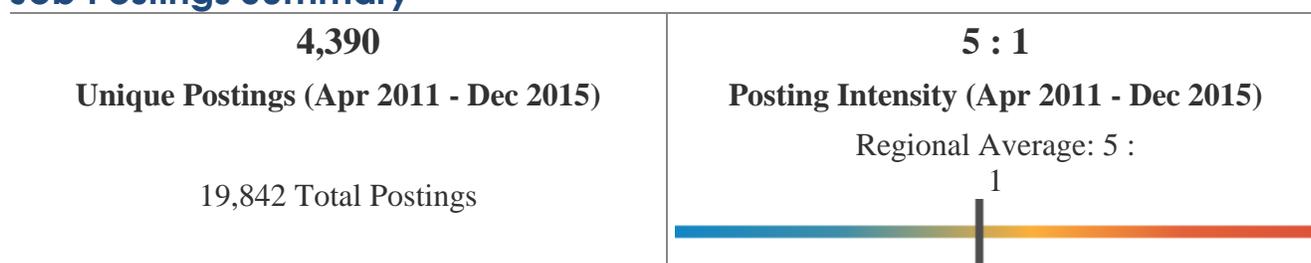|	Region	2010 Jobs	2015 Jobs	Change	% Change
●	7.5 mile	342	348	6	1.8%
●	Los Angeles County, CA	3,277	3,461	184	5.6%
●	Southern Counties, CA*	7,092	7,802	710	10.0%
●	California	12,876	14,274	1,398	10.9%
●	United States	100,898	107,827	6,929	6.9%

Southern Counties includes: Los Angeles, Orange, Riverside, San Bernardino, and San Diego.

Southern California Counties Regional Job Breakdown

County	2015 Jobs
Los Angeles County, CA	3,461
Orange County, CA	2,093
San Diego County, CA	1,504
San Bernardino County, CA	373
Riverside County, CA	372

Job Postings Summary

4,390	5 : 1
Unique Postings (Apr 2011 - Dec 2015)	**Posting Intensity (Apr 2011 - Dec 2015)**
19,842 Total Postings	Regional Average: 5 : 1

*There were **19,842** total job postings for 2 Occupations from April 2011 to December 2015, of which **4,390** were unique. These numbers give us a Posting Intensity of **5-to-1**, meaning that for every 5 postings there is 1 unique job posting. This is close to the Posting Intensity for all other occupations and companies in the region (5-to-1), indicating they are putting average effort toward hiring this position.*

Occupation Breakdown – Overall and % Change (2010-2015):

Occupation	2010 Jobs	2015 Jobs	Change	% Change
Architectural and Civil Drafters (17-3011)	6,459	7,103	644	10%
Drafters, All Other (17-3019)	633	700	67	11%

Occupation Breakdown - Overall and % Change Projection (2016-2021):

Occupation	2016 Jobs	2021 Jobs	Change	% Change
Architectural and Civil Drafters (17-3011)	7,283	7,276	-7	0%
Drafters, All Other (17-3019)	724	744	20	3%

Regional Trends - 5-year Projection Occupation Demand (2016-2021)
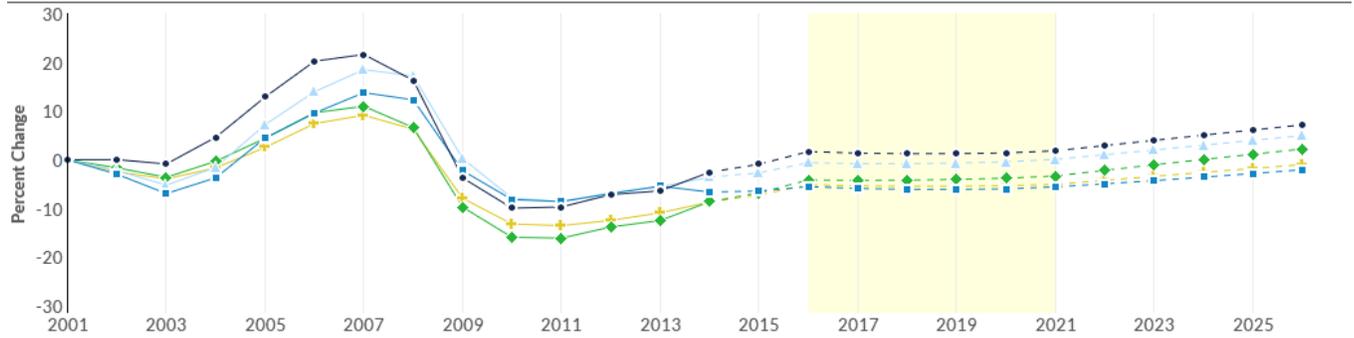
	Region	2016 Jobs	2021 Jobs	Change	% Change
●	7.5 mile	352	352	0	0.0%
●	Los Angeles County, CA	3,535	3,559	24	0.7%
●	Southern Counties, CA*	8,007	8,020	13	0.2%
●	California	14,679	14,805	126	0.9%
●	United States	110,268	110,354	86	0.1%

*Southern Counties includes: Los Angeles, Orange, Riverside, San Bernardino, and San Diego.

Southern California Counties Regional Job Breakdown

County	2021 Jobs
Los Angeles County, CA	3,559
Orange County, CA	2,089
San Diego County, CA	1,632
San Bernardino County, CA	371
Riverside County, CA	369

Job Postings Summary

1,132	4 : 1
Unique Postings (Jan 2016 - Jul 2016)	**Posting Intensity (Jan 2016 - Jul 2016)**
5,088 Total Postings	Regional Average: 7 : 1

*There were **5,088** total job postings for 2 Occupations from January 2016 to July 2016, of which **1,132** were unique. These numbers give us a Posting Intensity of **4-to-1**, meaning that for every 4 postings there is 1 unique job posting. This is lower than the Posting Intensity for all other occupations and companies in the region (7-to-1), indicating that companies may not be trying to hire this position.*

Occupational Programs

7	853	303
Programs (2015)	**Completions (2015)**	**Openings (2015)**

CIP Code	Program	Completions (2015)
15.1301	Drafting and Design Technology/Technician, General	453
04.0901	Architectural Technology/Technician	263
15.1303	Architectural Drafting and Architectural CAD/CADD	88
04.0902	Architectural and Building Sciences/Technology	43
15.1304	Civil Drafting and Civil Engineering CAD/CADD	4

Industries Employing 2 Occupations

Industry	Occupation Group Jobs in Industry (2016)	% of Occupation Group in Industry (2016)	% of Total Jobs in Industry (2016)
Engineering Services	2,408	30.1%	4.1%
Architectural Services	2,337	29.2%	16.3%
Landscape Architectural Services	644	8.0%	16.2%
Local Government, Excluding Education and Hospitals	196	2.4%	0.1%
Building Inspection Services	188	2.3%	16.1%

APPENDIX A
COLLEGE MISSION AND STRATEGIC INITIATIVES

ECC MISSION STATEMENT:

El Camino College makes a positive difference in people's lives. We provide excellent comprehensive educational programs and services that promote student learning and success in collaboration with our diverse communities.

STRATEGIC INITIATIVES for 2015-2020

A. STUDENT LEARNING
Support student learning using a variety of effective instructional methods, educational technologies, and college resources.

B. STUDENT SUCCESS & SUPPORT
Strengthen quality educational and support services to promote and empower student learning, success, and self-advocacy.

C. COLLABORATION
Advance an effective process of collaboration and collegial consultation conducted with integrity and respect.

D. COMMUNITY RESPONSIVENESS
Develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the educational, workforce training, and economic development needs of the community.

E. INSTITUTIONAL EFFECTIVENESS
Strengthen processes, programs, and services through the effective and efficient use of assessment, program review, planning, and resource allocation.

F. MODERNIZATION
Modernize infrastructure and technological resources to facilitate a positive learning and working environment.