Instructional Program Review Submittal Form (Appendix F)

This form is completed and submitted as a cover sheet for the self-study report

Name of the Program: Engineering Design Technology

Date Submitted: 03-29-2019

Scheduled Presentation Date: April 16th, 2019.

All courses in the program have been reviewed by the Curriculum Committee within the last six-year cycle *(circle one)* Yes

Explain any exceptions for non-compliance with curriculum requirements:

The self-study report adequately addresses the following components:

Description of the Program	Yes		No
Course and program content	x		
Student demographics	x		
Human resources	x		
Instructional Improvement	**Yes**		**No**
Teaching effectiveness	x		
Activities to improve student learning	x		
Course grading	x		
Course and program completion	x		
Program outcomes	x		
Core indicators (if vocational)	x		
Student feedback	x		
Institutional data	x		
Other	**Yes**		**No**
Strengths and weaknesses of the program	x		
Opportunities and threats of the program	x		
Goals of the program	x		

Self-Study prepared by: Dr. Miodrag Micic and David Li Reviewed by: Dr. Yannick Real.

Cerritos College CTE Program Review, Spring 2019

Program: Engineering Design Technology

Division: Technology

Program Description

Engineering Design Technology

The Engineering Design Technology (ENGT) program is currently offering four Certificates of Verification, two Certificate of Achievements (Engineering Design Technology and Engineering Design and Production Technology) and Associate of Arts, under the drafting TOP Code as listed in the Cerritos College 2018-19 catalogue. In addition to these two, the ENGT program is hosting Engineering Technology (ET) programs and the New Products Development (NPD) program. Engineering Technology (ET) offers six certificates of achievements and an AA option, while the NPD offers two certificates and two AA options. The department also offers courses that are grouped into areas identified by the industry to help meet both the student goals, as well as, business and industry needs for a skilled trained workforce. The students learn most up-to-date concurrent design for manufacturing technologies using the contemporary CAD and additive manufacturing tools. Besides serving the ENGT students, the departments serves the need for CAD and blueprint reading training to other technology division departments and have classes cross-listed with MTT, WELD and PMT programs. In addition, most classes have an optional final exam in the form of standard industrial certification. We are one of the top providers of Certified SolidWorks Associates (CSWA's), Certified SolidWorks Professionals (CSWP) and other SolidWorks related certified professional programs in the Southern California region.

Course offerings and focused training sessions developed in the ENGT program concentrate on mastering the three most important CAD systems:

- SolidWorks
- AutoDesk Inventor
- AutoCAD

And use thereof in:

- Blueprint drafting
- 3D parametric modelling
- Statics and dynamics simulation
- Additive manufacturing
- Design for manufacturing

Currently we are developing new classes to cover the growing needs in the area of cloud-based modelling, and we plan on introducing in 2019 the OnShape and Autodesk Fusion classes. The Graduates of the ENGT program from Cerritos College find their work in such diverse areas as: designing components for tooling; production systems for spaceships and medical devices; artificial organs; to designing oil refineries equipment; robots; manufacturing systems; automotive and general merchandise products.

Course Content and Delivery

The program consists of courses that are designed to dovetail with Verification Certificates, Certificates of Achievement, and the Associates of Arts Degree requirements for student success. The following comprises most of the program course content represented in the Certificate and Degree options and are offered in a 9-week and 18-week delivery formats. All courses are offered as classroom based only. This year two of the full-time ENGT faculties have completed the Online Teaching Certification at CTX and have submitted several of the classes for distance education. The core class is the ENGT116 – Blueprint Reading and the ENGT131 Introduction to Engineering Design Using Solid Modelling classes. The departments have reviewed all the class content in the last three years with the curriculum committee and have deactivated all the outdated classes. Currently we have several new classes in the curriculum awaiting approval. The new classes and removal of outdated classes are done based on the local industry input, and concerns expressed at our regular industrial advisory board meetings. All the ENGT courses are Title V Associate Degree applicable/credit courses. The currently offered courses are:

ENGT 103
INTRODUCTION TO ENGINEERING DESIGN USING INVENTOR 3.0 UNITS
Class hours: 2.0 Lecture/3.0 Laboratory

This course introduces the student to the design process in engineering technology using activities-based learning, project-based learning, and problem-based learning. The student will learn about the design process, geometric relationships, visualization, technical sketching, modeling, model documentation, and assemblies.
Transfer Credit: CSU

ENGT 104
PRINCIPLES OF AEROSPACE DESIGN TECHNOLOGY 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory

In this class, students will explore the world of aeronautics, astronautics, flight and aerospace engineering design technology. The class explores the evolution of flight, flight fundamentals, navigation, control, aerospace materials, propulsion, space travel, orbital mechanics, ergonomics, remotely operated systems, and related subjects. Students will use 3D design software to help design related solutions of typical aerospace technology problems. Students will design models of aerospace components, systems, gliders, airplanes, rocket models, and autonomous flight vehicles.
Transfer Credit: CSU

ENGT 105
PRODUCT DESIGN, DEVELOPMENT, AND PROTOTYPE FABRICATION 2.0 UNITS
Class hours: 1.0 Lecture/4.0 Laboratory
Prerequisite: ENGT 103, or ENGT 138, or ENGT 259, and ET 102, or NPD 104, or NPD 105, or equivalent with grades of “C” or higher or "Pass".

This is a capstone course in the Engineering Technology program. In this course, the students work in teams to design and develop an original solution to a valid open-ended technical problem by applying the engineering design process. Utilizing the activity-project problem-based

teaching and learning pedagogy, students will perform research to choose, validate, and justify a technical problem. After carefully defining the problem, students will design, build, and test their solution.
Transfer Credit: CSU

ENGT 116
BLUEPRINT READING 2.0 UNITS
Class hours: 1.5 Lecture/1.5 Laboratory
Recommendation: ENGT 131 or equivalent with a grade of “C” or higher or "Pass".

This course is a study of working drawings and blueprints used in engineering and manufacturing. Emphasis is placed on the ability to visualize and interpret typical drawings. Research is required regarding standards, specifications, procedures, bulletins, and techniques, which are a parallel part of the shop drawing system. It is intended to prepare the student for accurate interpretation of drawings in order to carry out the applications required or use them as appropriate engineering and manufacturing references.
Transfer Credit: CSU

ENGT 117
GEOMETRICAL DIMENSIONING AND TOLERANCING 2.0 UNITS
Class hours: 2.0 Lecture
Prerequisite: ENGT 116 or equivalent with a grade of “C” or higher or "Pass" or prior completion.

This is a basic course in datum, modifiers, form tolerance, positional tolerance, and coordinate tolerance conversion. It will introduce the students to the state of the art in dimensioning and tolerance used in industry.
Transfer Credit: CSU

ENGT 131
DESIGN FUNDAMENTALS INCLUDING 3D MODELING 3.0 UNITS
Class hours: 2.0 Lecture/4.0 Laboratory
Recommendation: ENGT 116 or equivalent with a grade of “C” or higher or "Pass".

This course stresses the basic design fundamentals of using the solid modeling software for students who have had no high school or no industry experience in CAD design or CAD drafting. Geometry construction, solid modeling, isometric rendering, orthographic projection, dimensioning, single auxiliary views, sectioning, and solid modeling practices will be introduced. Students will be able to 3D print their solid models and modify their designs based on the feedback they get from the instructor and their peers.
Transfer Credit: CSU

ENGT 133 SOLIDWORKS FOR SHEET METAL DESIGN 2.0 UNITS
Class hours: 1.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 103, or ENGT 138 or ENGT 259, or ENGT 265, or equivalent with a grade of “C” or higher or "Pass".

This course will familiarize students with sheet metal layout using SolidWorks tools to develop, bend allowances for pattern development, and manufacturing processes for sheet metal. It will also include applications to pipe layout and welding assemblies.

Transfer Credit: CSU

ENGT 138 INTRODUCTION TO ENGINEERING DESIGN USING AUTOCAD 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Recommendation: ENGT 116, and ENGT 131, or equivalent with a grade of “C” or higher or "Pass" or appropriate work experience.

This course focuses on the introduction to engineering design using the AutoCAD software. It includes drawing preparation based on 2D sketches and 3D models. It will prepare the students to operate the systems and understand the applications of computer graphics utilizing the industry standards. Students will learn to use an interactive computer graphics system to prepare drawings on their personal computers.
Transfer Credit: CSU; UC

ENGT 153 MACHINE DESIGN APPLICATIONS USING SOLID MODELING 3.0 UNITS
Class hours: 2.0 Lecture/4.0 Laboratory
Prerequisite: ENGT 103, 138, 259, or 265, or equivalent with a grade of “C” or higher or "Pass".

This course covers auxiliary projections, sections, dimensions, and threads and fasteners. This course will also cover working drawings of machine parts, including details and assemblies, basic gear, cam layout, and simple mechanisms.
Transfer Credit: CSU

ENGT 237 STATICS AND STRENGTH OF MATERIALS USING SIMULATION 3.0 UNITS
Class hours: 2.0 Lecture/4.0 Laboratory
Prerequisite: ENGT 103, or ENGT 138, or ENGT 259, or ENGT 265, or equivalent with a grade of “C” or higher or "Pass".

This is a course in the fundamental principles of statics and strength of materials and their applications to the solutions of typical force systems and equilibrium problems. Applications are made in the fields of welded, machined, extruded, and molded parts.
Transfer Credit: CSU

ENGT 257 ADVANCED MODELING USING INVENTOR 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 103 or equivalent with a grade of “C” or higher or "Pass".

This course assists students in advanced applications of three-dimensional parametric part modeling, assembly modeling, surface modeling, and bills of materials. Students receive instruction in utilizing the most recent release of Autodesk Inventor.
Transfer Credit: CSU

ENGT 258
TOOLS AND FIXTURES APPLICATIONS USING SOLID MODELING 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 103, or ENGT 138, or ENGT 259, or ENGT 265, or equivalent with a grade of “C” or higher, or “Pass”.

This course is a study of modern techniques of design using solid modeling. Instruction includes the production, operations, and process materials selection for product design. Planning, scheduling, and cost performance are used to implement design solutions.
Transfer Credit: CSU

ENGT 259 SOLIDWORKS INTRODUCTION 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory

This course assists students in creating three dimensional (3-D) parametric part modeling, assembly modeling, surface modeling, and bills of materials. Students receive instruction utilizing the most recent release of SolidWorks software.
Transfer Credit: CSU

ENGT 260 ADVANCED MODELING USING SOLIDWORKS 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 259 or equivalent with a grade of “C” or higher or "Pass", or appropriate work experience.

This course advances the student’s skill in creating three-dimensional (3-D) parametric part modeling, assembly modeling, and surface modeling. Students also learn how to create sheet metal assemblies, welding assemblies, formed tools, and molds.
Transfer Credit: CSU

ENGT 261 SOLIDWORKS FOR SUSTAINABLE DESIGN 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 259 or equivalent with a grade of “C” or higher or "Pass".

In this class, the students will perform life cycle assessment (LCA) of the design of products and predict their environmental footprint. Students will learn to assess how businesses take inputs, process them by adding value, and generate outputs which are tangible and sustainable products. Students will estimate the sustainability of their designs by performing LCA assessments and modify their products to make them “greener.” This will be achieved by evaluating different design and manufacturing and supply chain choices and by performing quantitative LCA analysis to justify their final decision. A major focus of this class will be for students to assess their design using the SolidWorks Environmental Management Systems (EMS). Finally, the students will operationalize the tracking, documentation, and reporting of environmental impacts of businesses, according to the ISO standard 14001. Students will also be prepared for the Certified Sustainable Design Associate industry certification exam.
Transfer Credit: CSU

ENGT 262 SOLIDWORKS FOR WELDMENTS DESIGN 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 259 or equivalent with a grade of “C” or higher or "Pass".

In this class, students will learn how to effectively use SolidWorks to model parametric weldments and welded structures. Standard structural tubing, angle iron, flat plate, pipe, machined components, and custom profiles will be employed and combined in the design of the models. Students will produce weldment shop floor drawings to be used during fabrication. The ANSI and ISO welding symbols will be explored and implemented in both the modeling of weldments and the rendering of shop floor drawings. Students will also be prepared for the Certified SolidWorks Professional Advanced Weldments industry certification exam.

Transfer Credit: CSU

ENGT 263 SOLIDWORKS FOR INDUSTRIAL MOLD TOOLS DESIGN 4.0 UNITS
Class hours: 3.0 Lecture/3.0 Laboratory
Prerequisite: ENGT 259 or equivalent with a grade of “C” or higher or "Pass".

In this class, the students will design molded product features and mold tools. Molded parts design will cover design features such as: draft, shell, ribs, vents, lips, mounting bosses, and snaps. Mold tools design will cover surfacing repairing, draft analysis, and parting surfacing creation. Design features such as: tooling split for core and cavity creation; knitting the surfaces; sketching the mold block; extracting the core block; and separating the block from the part will be emphasized using specialized menus from
SolidWorks. Students will also be prepared for the Certified SolidWorks Mold Tools
Design industry certification exam.
Transfer Credit: CSU

ENGT 299
DIRECTED STUDIES 2.0 UNITS
Class hours: 6.0 Independent Study

A course to provide opportunity for individual research and field projects under the direction of a faculty member in a given department. With the guidance of the faculty member, students prepare and carry out a written learning agreement describing the purposes and outcomes of the project. Students should expect to meet with the supervising faculty member one to two hours each week for conferences. Credit is based upon the number of hours in the semester expected to complete the project (2 units for 108 hours).
Transfer Credit: CSU

The program typically provides training for students who are “new” to the technology as well as those industry professionals and working individuals within the industry seeking to upgrade their skills and acquire current educational background including:
- New hires - Production personnel
- Assembly personnel - Manufacturing personnel
- Management personnel - Sales and support personnel
- College Bridge Program students (Middle School, HS juniors and seniors)

Institutional Data

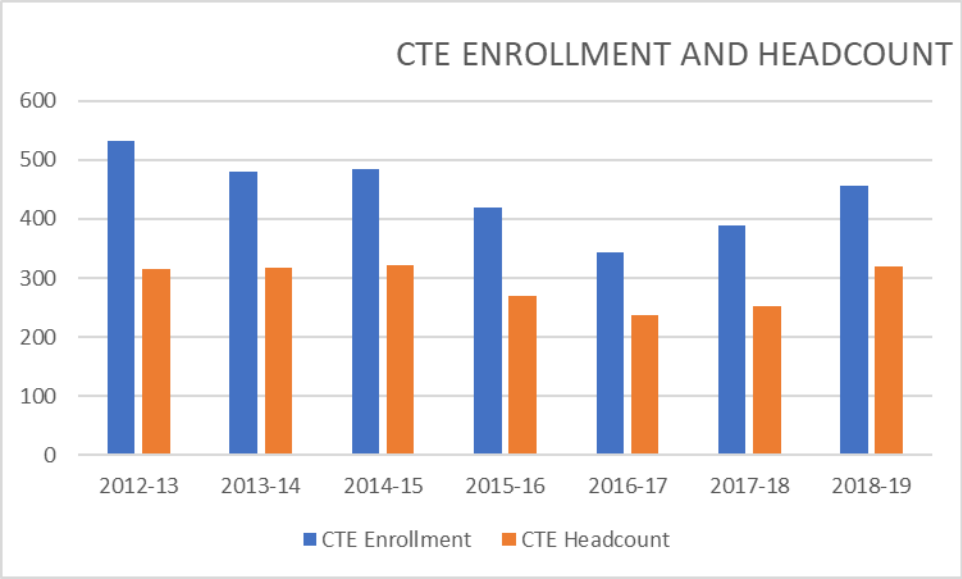
Most of the instructional data was provided by the Cerritos College Department of Institutional Effectiveness, Research and Planning. The data included: Perkins Indicators, course completion, fill, success rates; FTES, WSCH, Degrees and Certificates Awarded, and several registered majors. Supplemental data was obtained from the California Community Colleges DataMart. The TOP CODE is for Drafting(0903).

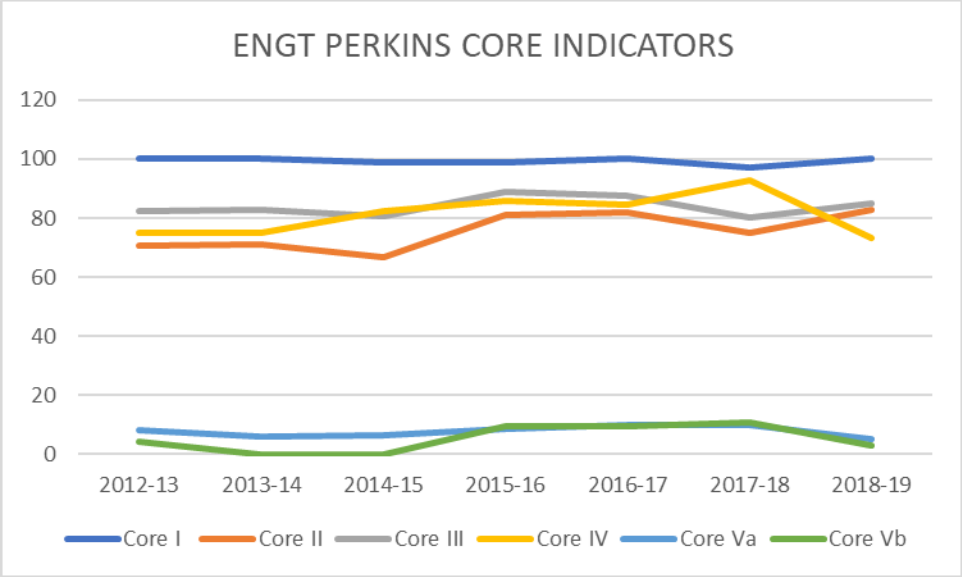
College Core Indicator Information by 6-Digit TOP (2012-2019)

Perkins IV, Title I, Part C Local Application

Perkins Indicators table for the last year, as described below:

Year	CTE Enroll	CTE Headc	Core I	Core II	Core III	Core IV	Core Va	Core Vb
2012-13	532	315	100.00	70.83	82.26	75.00	8.06	4.17
2013-14	481	318	100.00	70.97	82.93	75.00	6.10	0.00
2014-15	485	321	98.70	66.67	80.52	82.35	6.49	0.00
2015-16	420	270	98.77	81.08	88.75	85.71	8.64	9.38
2016-17	343	237	100.00	81.82	87.65	84.62	9.88	9.68
2017-18	389	253	97.18	75.00	80.00	92.59	9.86	10.71
2018-19	457	320	100.00	82.86	84.93	73.08	5.33	3.03
AVERAGE	444	291	99.24	75.60	83.86	81.19	7.77	5.28





Perkins Enrollment and Perkins Headcount:

Due to the interesting curriculum and good job prospects, the enrollment in the ENGT program has been steadily increasing since hitting rock bottom in 2016-17. The Enrollment has increased from 343 in 2016-17 to 457 in 2018-19. At the same time, we had an increase in the Headcount from 237 to 321. With further curricular improvements, and with the good reputation of the program with high employability by the local industry, and with the high number of PLTW high school articulation agreements, we expect the enrollment to grow significantly. Furthermore,

streamlining of the curriculum and the application of the guided pathways to the program will help to make the ENGT programs more appealing to the students.

ENGT Core Perkins Indicators

Core Indicator 1, which describes technical skills attainment is consistently close to 100% over the observed time period. This is mainly due to the high quality of demonstrated performance methods and flipped classroom approach, where most students fully attain the CAD Skills. The realistic value of this indicator is also proven by cross-correlating it with employability indicator (Core Indicator 4), which is unusually high and has increased from 75 to 92.59% in 2017-2018. The core indicator 4 is the best indicator for the quality and applicability of training to the local industry needs. As the local industry needs started changing in the partial by migration to the cloud based CAD starting in 2018, we have submitted to the Curriculum further program refinement to align program with the local industry needs, and we expect in 2019-2020 to see the Core indicator IV rising back to the 90s. Core indicator 2 – completion has increased from 70.83 to 82.86% due to the individualized approach to the student learning in the flipped class environment and due to the instructors posting instructional videos, which greatly helped students at homework.

Core indicator 3 is persistence and transfer are fluctuating in high 80% and we plan to increase it further by streamlining the program and creating a series of stackable and foldable certificates. The program's weak spots are core indicators 5, which in the case of the ENGT program are female participants. We have seen indicator fluctuation from 3 to 10.7 %. Instructors are creating curricular assignments which are appealing to the average female students' interest. For example, the soft products and the household objects modelling instead of strictly machine and aerospace parts modelling and are planning to develop the soft products development and the packaging development classes, for a position which in industry attracts larger number of female candidates. Furthermore, we plan to hire female part-time instructor. The highest indicator of 10.71% value of 5b was at the time when the College had a part-time female instructor who was able to attract large group of female students to her class. We are actively looking to find similar part-time candidate. Further curricular modifications will continue growth of the Perkins indicator and enrollment.

WSCH:

For Engineering Design Technology in the six-year span from 2012 to 2018, the WSCH range was 3096 to 2357.5 with a Mean of 2826.71. This Trend fluctuated from 2012 to 2018 with a peak in 2015. For the Engineering Technology in the six-year span from 2012 to 2018, the WSCH range was 977.75 to 178.5 with a Mean of 581.54. This Trend rose drastically from 2012 to 2013 followed by a gradual decline up to 2018.

FTEF and WSCH/FTEF

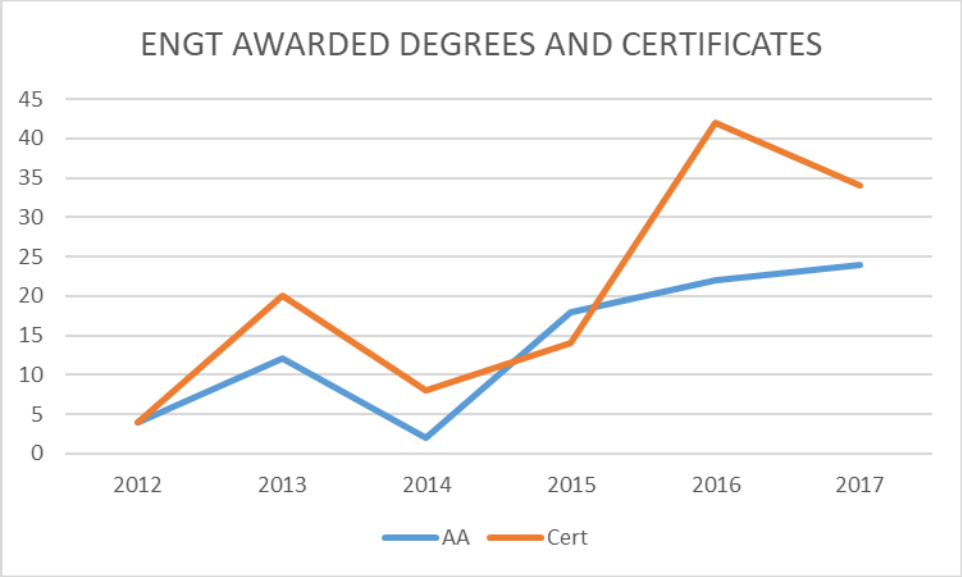
The data was not directly available in the datamart. However the data was available for the ration of WSCH/FTEF . The WSCH/FTF ranges from 515.9 to 364.88 and in general was declining until 16/17, and raised back to 406.16 in 17/18 due to retirement of Jaya Hiranandani,

the full time faculty. The calculated FTF range (by dividing WSCH with WSCH/FTF) fluctuated with general increasing trend from 5.05 in 2014-15 to 7.66 in 2017-2018.

FTES

For the Engineering Design Technology for the six-year span from 2012 to 2018, the FTES range was 108.85 to 85.22 with a Mean of 100.68. This trend fluctuated from 2012 to 2018 with a peak in 2015. For the Engineering Technology for the six-year span from 2012 to 2018, the FTES range was 19.83 to 4.17 with a Mean of 15.52. This trend fluctuated from 2012 to 2018 with a peak in 2015.

Degrees and Certificates Awarded



	AA	Cert
2012	4	4
2013	12	20
2014	2	8
2015	18	14
2016	22	42
2017	24	34

The degree and certificate trends for the ENGT are presented on the graph above. This Data is from Datamart. The trends are on the rise, with a fluctuation in 2017 in certificates. With planned simplification and streamlining of the certificates and creation of the stackable certifications we expect to increase awards for at least twice in the next six-year period.

Majors

Data was available for Fall semesters from 2012-2017 and Spring semesters for 2017-2018. From 2012 to 2014 the program was the top 8th chosen from all college majors. In 2015 the program was in 7th place and in 2016 it was in the 6th place. From 2012 to 2016, the program was listed as “Engineering/Eng. Design Tech” in the fact book’s top 20 majors. In 2017, only “Engineering” was written in the 6th place mark. Overall, the program has been on an incline.

Enrollment/Fill Rate

For the six-year span from 2012 to 2018, the class fill rate range was 100% to 81% and on average 91%. This trend fluctuated from 2012 to 2018.

Course Completion/Retention Rate

For the six-year span from 2012 to 2018, the course completion rate ranged from 89% to 47% and on average 75%. Trend for completion was quite stable across the six years with a peak in 2015 by term.

Successful Completion/Success Rate

For the six-year span from 2012 to 2018, success rate ranged from 47 to 87% and on average 73%. This trend fluctuated from 2012 to 2018.

Note: for fill, retention, and success rates, the 2018 academic year does not include summer 2018 data. So, values may appear lower than the actual when comparing to the previous academic years.

Grade Distribution Data (Disaggregated)

Grades show an incline in the overall counts. A’s far exceeded every other grade received, B’s second, and W’s third most frequently received. Incline in the ages 24 and under, declines in the ages 25-29, and relative plateauing for all other age groups. Students are predominantly male with inclines in grade counts for both Female and Male groups. Primarily Hispanic and Asian ethnicities represented and is representative of the local demography.

SWOT Analysis

All the SWOTs for the ENGT department are aligned with the global institutional goals, as per master plan. The name of the Institutional Goal precedes the name of the SWOT.

Strengths

1. Goal A: Strengthening the Culture of Completion: Current with state of the art in the engineering design technology practice

2. Goal B: Ensuring Program Alignment by Strengthening Partnerships: Established leadership in SolidWorks education and certification

3. Goal B: Ensuring Program Alignment by Strengthening partnerships: Students earning standard industrial certification such as: Certified SolidWorks Associate; Certified Sustainable Design Associate; Certified Simulations Associates; and Certified SolidWorks Professional.

4. Goal E: Upgrading Educational Infrastructure: State of the art prototyping laboratory for teaching concurrent engineering practices

Weaknesses

1. Goal A: Strengthening the Culture of Completion: Lack of non-traditional completers (Perkins Indicator V), in this case females, participating in the program

2. Goal A: Strengthening the Culture of Completion: Lack of capstone classes.

3. Goal A: Strengthening the Culture of Completion: Lack of consistent class offerings

4. Goal C: Promotion Leadership and Staff Development: Lack of diverse qualified pool of part-time instructors.

Opportunities

1. GOAL B: Ensuring Program Alignment by Strengthening Partnerships: Strong aerospace, medical devices and high-tech manufacturing base

2. Goal B: Ensuring Program Alignment by Strengthening Partnerships: Addition of Nanotechnology and MEMS subjects/lesson plans

3. Goal F: Enhancing Educational Effectiveness: Close collaboration with PMT and MTT departments in developing drone programs Support a technology-based learning environment: Enhance prototyping capabilities

Threats

1. Goal D: Improving Internal and External Communications: Negative image about the engineering or technology occupations in general student populations, especially with females as something dirty or blue collar work or someone that you call to fix the things

.Another negative perception is that you need to be very proficient in math in order to be an engineering professional, what for most jobs is completely not true.

2. Goal B: Ensuring Program Alignment by Strengthening Partnerships Changes in the landscape of the local manufacturing base
3. Goal D: Improving External and Internal Communications: Competing program from other institutions.
4. Goal F: Enhancing Organizational Effectiveness: Computers obsolescence every two years due to software requirements changes

Goals of the Program

Ref	Goal	Actions to be taken	Person in charge	Completion Date
S1 /O1 O3	Write and offer medical devices, UAV/drones design, consumer goods and Arduino specific engineering design classes.	Write classes and submit to Curriculum for approval	Micic, Li	SP 2019
W2	Provide the Students with clear pathways for achieving their educational goals: Sustain FabLab activities	Need a budget for materials and equipment to sustain our competitive advantage, additive manufacturing fabrication lab, going on for the next two years. I need about $10,000 per year for 3D printer maintenance, purchasing of 3d printing materials, and other materials and tools. This equipment allows students to contextualize learning and bring home finished prototypes of their project. It contextualize different areas of design and engineering.	Micic, Li	FA2023
S3 /w2	Update computers in the lab to allow PDM, and advanced Solidworks functionalities	Upgrade PST224 and PST227 with more powerful dual screen computers to allow use of all the Solidworks add-ons and Autodesk applications. Currently it's impossible to use Solidworks photorealistic rendering, some of the Autodesk functionalities and some of the simulations due to the computers power constrain.	Micic, Li	SP2022

S4 /w2 /O1 /O3 /T4	Updating Educational Infrastructure: Replace computers every two years to keep with the update in software	Replace computers every two years to keep up with updates in the software development and current industry practice. Explore and find all internal and external fundings.	Micic, Li	FA2025
W1	Increase non-traditional students' participation (female students) by creating the soft products development class.	Write curriculum for the soft products development class using ExactFlat or similar software where students design soft products, like purses, fashion elements, apparels, phone holders and other soft products items of usual interests to females.	Micic,	FA2023

S3 /W2	Investigate the development of expansion of educational program to align with the needs of the current and future labor markets and develop graduates with the skills to satisfy the workforce demand: Offering new specialized certifications	Repeat success of SolidWorks certification program by offering standard industry certification for Autodesk programs. There is increase in proliferation of AutoDesk Fusion360 with local industry, and student certifications as Certified Autodesk Users for Fusion360 will greatly enhance their employability.	Micic, Li	FA2019
T3 /O3	PERKINS 2018/19 Reverse engineering training using computerized optical comparator	Teach students how to use modern computer controlled optical comparators to reverse engineer complex parts.	Micic, Li	FA2021

O2 /S4	Establish nanotechnology and MEMS design and inspection lesson across	Establish the nanotechnology and MEMS design class	Micic, Li	Sp2022
W3	Increase faculty diversity and increase the likelihood of enrollment of nontraditional participants (female students) by hiring female part-time instructor.	Hire a qualified female part-time instructor for FA 2019.	Micic, Li	FA2020
W3	Increase class offerings	Increase class offerings through offering morning class sections	Micic, Li	FA2025
W4	Hire new part-time instructors	Increase class offerings by hiring part-time faculties. Open hiring pool in Fall 2019	Micic, Li	SP2020
S3 /O3	Converting Verification of Completion Certificate to the Certificate of Achievements	Submit a new certificate to curriculum for approval	Micic	FA2020
W3	Online teaching certifications for the ENGT instructors	All ENGT part and full-time instructors to complete CTX Online Teaching Certification.	Micic	FA2019

S2 /S4 /W2 O1	Update computers lab to allow PDM, and advanced Solidworks functionalities	Upgrade PST224 and PST227 with more powerful dual screen computers to allow use of all the Solidworks add-ons and Autodesk applications. Currently it's impossible to use Solidworks photorealistic rendering, some of the Autodesk functionalities and some of the simulations due to the computers power constrain.	Micic	SP2020
O2 /T3	SWP2-2 Incorporate materials science nanostructure characterization in NPD103, and ENGT131 classes	Using the SEM, EDX and SE Detector incorporate the practical aspects of micro and nanoscale design technologies	Micic	SP2020
T1	Participate in the campus events to promote the ENGT department	Faculties and Students participate in campus and off-campus events to promote the ENGT department. Increase participation by 50% by participating in every single high school fairs/promotion activities (currently ENGT does about 50% of activities).	Micic	SP2021
O1	Write and offer industry specific classes	Write and offer medical devices, UAV/drones design, consumer goods and Arduino specific engineering design classes.	Micic, Li, PT faculties	SP2021

S3 /W3 /T2	Become regional leader and reference center for Solidworks, based on the strength of full-time instructors	Keep leadership position as a most knowledgeable SolidWorks institution in the area by continuous education of full-time instructors, and by attending relevant industry conferences	Micic, Li	FA2020
S1	Increase program attractiveness to general education students by adding general education component to the appropriate classes	Create ENGT137 Introduction to Making Useful Things and Industrial Design Using Fusion360, and add general education component to it under fine art category for plan A.	Micic, Li	FA2022
W4	Establish program SLO and align them with iSLO.s	Establish program SLOs and align them with institutional SLOs. Update and revise SLO's as needed. By end of FA2019 perform SLO evaluations in 100% of classes.	Micic, Li	SP 2020
W3	Revise programs to streamline completion	Submit revised programs to curriculum for approval	Micic, Li	SP 2020
S1	Create online/hybrid program	Convert all core classes to online/hybrid by FA 2020	Micic, Li	SP2020

S1	Start teaching cloud-based CAD	Write classes for OnShape and Fusion 360	Micic, Li	FA2020
W2	Increase non-traditional class participation	Hire female instructor; create soft product development class	Micic, Li	FA2021.

SLO

The program does have defined SLOs for all the classes. However, as there are very few concurrent classes offered, we have not performed SLO's assessments consistently. For the SLOs performed, the results were very high. This is because the SLOs are well aligned with students' lab activities, and are example of "take home SLOs", which are very tangible in nature. Students either make the model or not. The faculty will assure that all the participating students complete all the tasks and learn how to make the models and drawings. The high SLOs are verified by the very high employability of our graduates (Perkins 4), where essentially only the students who choose not to work do not have a job. Only class with concurrent offering which was done the SLO was ENGT117. The results are presented below

Cerritos College SLO Committee - Assessment Results - Three Year Comparison (Fall 2015 to Spring 2018)

Engineering Design Technology Department	Semester	Number of Assessments Good	Satis.	Emergent	Total	Percentages Good	Satis.	Emergent
ENGT 117	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	-	-	-	-	-	-	-
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	90	25	25	140	64.3%	17.9%	17.9%
	Spring 2016	85	15	40	140	60.7%	10.7%	28.6%
	Fall 2015	-	-	-	-	-	-	-
	Total	175	40	65	280	62.5%	14.3%	23.2%
Report Totals	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	-	-	-	-	-	-	-
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	90	25	25	140	64.3%	17.9%	17.9%
	Spring 2016	85	15	40	140	60.7%	10.7%	28.6%
	Fall 2015	-	-	-	-	-	-	-
	Total	175	40	65	280	62.5%	14.3%	23.2%

No data for ENGT 103, 117, 131, 138, 151, 153, 158, 160, 237, 256, 257, 258, 259, 250, 265, 266

Conclusion:

In the last 7 years, faculties have significantly evolved and improved the ENGT department. All the outdated courses were deactivated, new courses were created which are based on the local industry needs. The programs have a great reputation in the South Bay industry, especially within the aerospace and government sub-contractors. The demand for qualified CAD operators and designers/drafters outpaces the supply. We are trying to increase the program enrollment by creating a network of articulated PLTW agreement with local high schools. This was done in the past 5 years and resulted in a steady supply of bridge and traditional students, in difference to previous demography of practically exclusive life learners. To increase enrollment, we are planning further internal outreach and external outreach to local high schools. To increase the program's attractiveness, we are developing several cutting-edge classes. In collaboration with PMT and NPD program, we are looking at developing the first micro design/MEMS/Nano technology design classes in California at community college level. To increase the non-

traditional students' participation, we plan to develop the soft products development class, and to increase and sustain the employability of the students we have developed the latest cloud-based CAD classes. Due to the proximity of PMT, MTT, WMT and WELD department which are centers of the manufacturing excellences, we are able to cross-enroll students and to teach them the true design for manufacturing. As an immediate action item, we are going to submit before the end of this semester a list of revised SLO's and to define the pSLO's and align them with iSLO's and to complete the programs revisions in the next curriculum cycle.

Appendix D: The Self-Checklist

Check	List
x	Course outlines have been reviewed within the last 3 years.
x	Courses that have not been offered over the last three years have been reviewed and are scheduled for inactivation.
x	Prerequisites/co-requisites have been reviewed to assure they are still necessary. Content review and/or statistical validation has been completed within the last 3 years. CTE course prerequisites need to be reviewed every 2 years.
x	Course outlines list current texts and Electronic Information Technology to comply with Board Policies and the law: Cerritos College BP & AP 3720,3411 and Section 508 standards (law).
IN PROGRESS	Course outlines list current SLOs.
x	Current course outlines have been submitted to the curriculum specialist in the Academic Affairs office.
N/A	Courses offered as distance education have been approved by the Curriculum Committee to be offered as DE and match the delivery methods outlined in the original proposals.
x	(If applicable) text outlines are available for faculty teaching a course for the first time.
x	Required courses for the degrees and certificates have been offered within the last 2 years.
x	Enough elective courses for the degrees and certificates have been offered within the last 2 years.
x	Degrees/certificates have been reviewed to identify any inactivated, deleted, or changed courses. If applicable, the program has been updated to reflect these changes.
x	All department courses are part of an approved degree or certificate.
x	Current degrees and certificates have been updated.
x	Students are completing the degrees and/or certificates. If not, the degree/certificate has been reviewed for change or inactivated.

Appendix E: The Annual Student Learning Outcome (SLO) Assessment Goals

NOT APPLICABLE, as stated earlier due to lack of the concurrent sections due to low enrollment, the comprehensive SLO data is not available. The cSLO is available for ENGT117. Starting from FA 2019, we will evaluate cSLO's for each class, regardless of the concurrent sections, and will revise/create pSLO's and align them with the iSLO's.

Cerritos College

Instructional Program Review Instructional Program Review Checklist (Appendix G)

This form is completed by the IPR committee during the review of each program's self-study report presentation (Phase 4)

Name of the Engineering Design Technology (ENGT)

Visitation Date 04/16/2019

IPR Committee Liaison: Angela Conley and Sunday Obazuaye

Evaluation of Compliance with Institutional Requirements	Yes	No
All courses in the program have been reviewed by the Curriculum Committee within the last six year cycle?		
Program is in compliance with guidelines established by the Student Learning Outcomes task force?		
Institutional Data used is current as of the draft due date?		
Program and Primary Data included information which is less than 2 years old?		

The self-study report adequately addresses the following components:

Description of Component

Description of the Program	Yes	No
Course and program content		
Student demographics		
Human resources		
Instructional Improvement	**Yes**	**No**
Teaching effectiveness		
Activities to improve student learning		
Course grading		
Course and program completion		
Program outcomes		
Core indicators (if vocational)		
Student feedback		
Institutional data		
Other	**Yes**	**No**
Strengths and weaknesses of the program		
Opportunities and threats of the program		
Goals of the program		

Instructional Program Review Instructional Program Review Approval Form (Appendix H)

Committee Action taken:

Approved ☐ Not Approved ☐

Recommendations:

Program Review Chair_____

Explanation for non-approval: