CAD TECHNICIAN – MECHANICAL DESIGN & MANUFACTURING

**JUSTIFICATION:**

This is an existing approved occupational skills certificate to be modified to a low-unit certificate of achievement for student certificate transcriptability for student’s academic purposes & success.

**Program Goals & Objectives**

Identify the goals and objectives of the program.

1. Demonstrate an ability to communicate effectively using technical, graphical, oral and written formats.
2. Demonstrate appropriate mastery of industry technical graphic standards, Computer-Aided Design techniques, sustainable technology and rapid prototyping and additive production technologies in the design of components, systems or processes of mechanical design.
3. Demonstrate appropriate mastery of industry technical graphical standards in the analysis of technical graphics and digital prototypes of mechanical design components, systems or processes.
4. Collaborate effectively in teams to produce comprehensive design technology solutions to mechanical and manufacturing processes and systems.

**Catalog Description**

The curriculum prepares students to read and create technical graphics and 3-dimensional digital prototypes for the design of mechanical components within a fabrication process. Technologies utilized in the program include parametric solid modeling CAD systems to generate 3D models, technical graphics and analysis, presentation renderings, and to produce laser cut and 3D printed mechanical prototypes.  A CAD technician supports design & fabrication activities with knowledge of sustainable production processes and industry standards. Job functions include CAD modeling, geometric problem solving, presentations of design reviews, and collaborating in design projects.  Interpretation of engineering drawings is based on American Society of Mechanical Engineers (ASME) Y14 standards.

A Certificate is awarded upon completion of all required courses with a grade of C or better.

**Program Requirements**

Required units in the program: 13

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirements** | **Dept. Name/#** | **Name** | **Units** | **Sequence****Option A** |
| Required Core (13 units) | DT 008ADT 008BDT 008CDT 030 | Introduction to Digital Design and FabricationIntermediate Digital Design and FabricationAdvanced Systems Design & FabricationSustainable Technologies | 3343 | Yr 1, FallYr 1, SpringYr 1, SummerYr 1, Fall |

Required Core: 13 units

Proposed Sequence

Year 1, Fall = 6 units

Year 1, Spring = 3 units

Year 1, Summer = 4 units

Total Units: 13 units

**Master Planning**

The purpose of the program is to support students to gain the skills necessary to obtain entry level careers in mechanical design and fabrication through the use of CAD (computer-aided design) software and fabrication technologies.

This program aligns with the following goals of the Educational Master Plan:

* Increase the median earnings and/or the regional living wage for students who exit the college.
* Align all degrees and certificates with appropriate workforce demand.
* Increase work-based learning opportunities.
* Create and sustain a culture of viable career pathways for all students

**Enrollment and Completer Projections**

|  |  |  |
| --- | --- | --- |
|  | 2019-2020 | 2020-2021 |
| CB01: Course Department Number | CB02: Course Title | Annual # Sections | Annual Enrollment Total | Annual # Sections | AnnualEnrollment Total |
| DT 008A | Introduction to Digital Design and Fabrication | 8 | 179 | 10 | 184 |
| DT 008B | Intermediate Digital Design and Fabrication | 2 | 35 | 2 | 44 |
| DT 008C | Advanced Systems Design and Fabrication | 1 | 19 | 1 | 15 |
| DT 030 | Sustainable Technologies | 1 | 13 | 2 | 34 |

The following certificate counts were awarded below, however this was during pandemic remote teaching environment and increase is expected in current hybrid teaching format.

|  |  |
| --- | --- |
| 2020-2021 | 2021-2022 |
| 2 students | 6 students |

Future years’ course enrollment and completions are projected to be in line with data provided from 2020-2021, with completions increasing around 5% per year.

* Projected Annual Program Completers: 8-15 per year

**Place of Program in Curriculum/Similar Programs**

Before completing this section, review the college’s existing program inventory in the CCC Curriculum Inventory, then address the following questions:

1. Do any active inventory records need to be made inactive or changed in connection with the approval of the proposed program? If yes, please specify. **YES, we need to make this a low-unit Certificate of Achievement (from an existing approved occupational skills certificate). C&I process needs to be updated for the changes.**
2. Does the program replace any existing program(s) on the college’s inventory? Provide relevant details if this program is related to the termination or scaling down of another program(s).  **No**
3. What related programs are offered by the college? **N/A**

**Similar Programs at Other Colleges in Service Area**

There are a number of colleges offering Engineering Technology and/or Mechanical Design CAD Drafting courses. The LMI data shows that there does not appear to be a supply gap for the occupations of interest. However, the supply is within the COE’s acceptable margin (25% over or under the number of annual openings) and is therefore considered “supply met” rather than a “supply gap.” additionally, entry-level wages exceed the self-sufficiency standard in both Los Angeles and Orange Counties, and the Bureau of Labor Statistics lists an associate degree as the typical entry-level education for the occupations in this report.

\*\*Yellow highlighted are programs that are not aligned with our program.

|  |  |
| --- | --- |
| Cerritos | Mechanical Engineering Design Technician Certificate of Achievement |
| East LA | AS Engineering Graphics and Design Technology |
| El Camino | Computer-Aided Design Drafting Certificate of Achievement |
| Glendale | Engineering Technology – CAD & Design Drafting |
| LA Harbor | Programs are not similar (no computer-aided design drafting programs) |
| LA Pierce | Engineering Graphics and Design Technology Certificate of Achievement |
| LA Valley | Mechanical Drafting/Design Certificate. Program review looks to show only one computer-aided design course. Not applicable |
| Long Beach | Drafting - Mechanical Design Certificate of Achievement |
| Mt San Antonio | Industrial Design Engineering |