ADVANCED MANUFACTURING AND DESIGN, MANUFACTURING AND DESIGN - CERTIFICATE

ETCI

Companies are integrating computers into engineering and manufacturing environments at a rapid pace. At the heart of advanced manufacturing is CNC machining and the computer applications that support the design and manufacturing process. This program builds the basic skills and knowledge for employment opportunities in the CNC manufacturing environment. The certificate covers areas of science and mathematics as they apply to machining practices and CNC programming. Emphasis is placed on both theoretical and practical phases of the design, cost and production of machine parts.

The certificate can be completed in a summer and fall semester, or in a summer, fall and spring semester. The certificate courses are offered in the day and evening. The accelerated summer-fall version will require attending classes four days a week. Certificate completion prepares students to enroll in a second, more advanced CNC-centered certificate – Advanced Manufacturing and 3D Prototyping (ETCA). The combination of the two certificates, ETCI and ETCA, can be applied toward the Advanced Manufacturing and Design A.S. degree (ETMA) without a loss of credit.

Note: Many courses require prerequisites, corequisites and/or testing. See course descriptions for details (https://catalog.ccri.edu/course-descriptions/).

Program Learning Outcomes

Upon completion of this program, a student will be able to:

1. Ability to quantitatively analyze technical problems, and produce a solutions.
2. Ability to visualize three dimensional objects.
3. Ability to model three dimensional objects.
4. Ability to read blueprints and understand dimensioning.
5. Ability to interpret mechanical dimensioning and tolerances.
6. Understand the basics of manufacturing.
7. Skill to machine basic parts from various materials.
8. Ability select proper tools, speeds and feeds for shaping materials.
9. Ability to apply "G" and "M" coding to CNC programming.
10. Ability to perform precision mechanical measurements.

Certificate Requirements

Code	Title	Hours
ENGR 1030	Engineering Graphics	3
ENGT 2090	Advanced Solid Modeling	3
ETCN 1100	Blueprint Reading and the Machinery's Handbook [1]	3
ETCN 1200	Precision Measurement and Geometric Dimensioning and Tolerance [1]	3
ETCN 1300	CNC Machining I	3
ETME 1020	Introduction to Manufacturing Processes	3
Total Hours		**18**

[1] Seven-week course

Recommended Course Sequence (Accelerated Version)

Course	Title	Hours
Year 1		
Semester 1		
Summer:		
ENGR 1030	Engineering Graphics	3
ETME 1020	Introduction to Manufacturing Processes	3
	Hours	**6**
Semester 2		
Fall:		
ENGT 2090	Advanced Solid Modeling	3
ETCN 1100	Blueprint Reading and the Machinery's Handbook [1]	3
ETCN 1200	Precision Measurement and Geometric Dimensioning and Tolerance [1]	3
ETCN 1300	CNC Machining I	3
	Hours	**12**
	Total Hours	**18**

[1] Seven-week course