Certificate in CNC Machining

Curriculum Sequence and Course Descriptions

ME105 CAD WITH SOLIDWORKS 3 CREDITS
As an introductory course to CAD (Computer-Aided Design) with SolidWorks, this course begins with creating properly dimensioned 2-D sketches and, over the semester, progresses towards creating fully dimensioned 3-D parts and assemblies. The students complete a series of projects that practice their ability to read sheet drawings, visualize the dimensioned object in 3 Dimensions, create a 3-D model and create a wholly dimensioned sheet drawing from the 3-D model. In addition, the basics of Assembly creation within SolidWorks are also introduced.

ME150 INTRODUCTION TO MANUFACTURING 4 CREDITS
Introduction to the basic processes related to machining and cutting engineering materials. Methods of joining both mechanical and welding, brazing, and soldering. The use of measuring instruments for the production of accurate parts.

ME106 ADVANCED CAD 3 CREDITS
As continuation of the prerequisite course "ME105 Introduction to CAD using SolidWorks". This course covers intermediate tools in SolidWorks, which make it possible to create complex parts and assemblies. In addition, a large emphasis is placed on the clear articulation of "design intent" and the creation of "professional quality" SolidWorks models. In terms of SolidWorks concepts, the course covers creating complex curves and surfaces and using configurations, equations, loft features, sweep features, and multi-body tools. Prerequisites: ME105

ME151 MANUFACTURING PROCESSES AND CNC MACHINING 4 CREDITS
The study of advanced manufacturing processes such as forging, casting, forming processes, injection molding, thermoforming and composite layups. Programming and operation of CNC equipment including an introduction to Robotics. Prerequisites: ME105, ME150

ME220 MASTERCAM MILLING I 4 CREDITS
The students will receive the basics of two-dimensional part programming, including geometry development, milling, drilling, tapping, and pocketing. Prerequisites: ME106, ME151

ME225 MASTERCAM MILLING II 4 CREDITS
This course is a continuation of topics students in ME220. Students will work with 3D model building, tool path selection, creation, and verification. This course serves as a solid foundation for Computer Numerical Control (CNC) programmers to develop sound modeling skills within the MASTERCAM CAD environment and is an essential toolset for a MASTERCAM programmer. Prerequisites: ME106, ME151, ME220

ME250 ADVANCED MANUFACTURING AND CNC 4 CREDITS
Rapid prototyping is covered from concept to completed part. The use of SolidWorks models to generate CNC programs and parts. Prerequisites: ME106, ME151

ME241 SOLIDWORKS CERTIFICATION PREPARATION CLASS 3 CREDITS
This course prepares students for the Certified SolidWorks Associate (CSWA) Certification Exam. Sample tests and questions are given in a proctored, exam-like environment providing the students an opportunity to practice and improve the skills they need to pass the certification exam. Prerequisites: MA120, ME105, ME106, ME240

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Certificate Outcomes

Upon successful completion of the Certificate in CNC Machining, the graduate will be able to:

- Utilize SolidWorks to produce engineering part models, drawings, assemblies and to analyze interference fits and tolerances.
- Program and operate CNC machining equipment in an industrial environment.
- Understand manufacturing processes and their uses in industry.
- Design and build products and equipment for a changing technical environment.
- Effectively communicate technical observations, results, issues and successes in both oral and written form.
- Work effectively in a team-oriented/project-focused work environment.