COURSES

MACHINING (MAC)

MAC 121 Introduction to CNC **2.0 UNITS**
This course introduces the concepts and capabilities of computer numerical control machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to explain operator safety, machine protection, data input, program preparation, and program storage.

MAC 122 CNC Turning **2.0 UNITS**
This course introduces the programming, setup, and operation of CNC turning centers. Topics include programming formats, control functions, program editing, part production, and inspection. Upon completion, students should be able to manufacture simple parts using CNC turning centers.

MAC 124 CNC Milling **2.0 UNITS**
This course introduces the manual programming, setup, and operation of CNC machining centers. Topics include programming formats, control functions, program editing, part production, and inspection. Upon completion, students should be able to manufacture simple parts using CNC machining centers.

MAC 131 Blueprint Reading-Machining I **2.0 UNITS**
This course covers the basic principles of blueprint reading and sketching. Topics include multi-view drawings; interpretation of conventional lines; and dimensions, notes, and thread notations. Upon completion, students should be able to interpret basic drawings, visualize parts, and make pictorial sketches.

MAC 141 Machining Applications I **4.0 UNITS**
This course provides an introduction to a variety of material-working processes that are common to the machining industry. Topics include safety, process-specific machining equipment, measurement devices, set-up and layout instruments, and common shop practices. Upon completion, students should be able to safely demonstrate basic machining operations, accurately measure components, and effectively use layout instruments.

MAC 142 Machining Applications II **4.0 UNITS**
This course provides instruction in the wide variety of processes associated with machining. Topics include safety, equipment set-up, holding fixtures, tooling, cutting speeds and depths, metal properties, and proper finishes. Upon completion, students should be able to safely demonstrate advanced machining operations, accurately measure components, and produce accurate components with a proper finish.

MAC 143 Machining Applications III **4.0 UNITS**
This course provides instruction in the field of advanced machining. Emphasis is placed on creating complex components, close-tolerance machining, precise measurement, and proper equipment usage. Upon completion, students should be able to demonstrate the ability to produce an accurately machined component with a quality finish using the proper machining process.

MAC 152 Advanced Machining Calculations **2.0 UNITS**
This course combines mathematical functions with practical machine shop applications and problems. Emphasis is placed on gear ratios, lead screws, indexing problems, and their applications in the machine shop. Upon completion, students should be able to calculate solutions to machining problems.

MAC 161 Metrology, Insp. & Testing I **3.0 UNITS**
This course covers techniques of metrology and inspection methods. Emphasis is placed on the use of inspection systems and measurement equipment for data collection and analysis to meet the quality assurance needs in manufacturing and production environments. Upon completion, students should be able to demonstrate competence in the care and use of various measurement tools and the implementation of a calibration program.

MAC 162 Metrology, Insp. & Testing II **2.0 UNITS**
This course provides in-depth mastery of measurement and inspection skills using advanced technologies. Topics include utilizing a coordinate measuring machine (CMM) and geometric dimensioning and tolerancing (GD&T) techniques. Upon completion, students should be able to utilize advanced metrology techniques and equipment to meet the quality assurance demands of industry.

MAC 222 Advanced CNC Turning **2.0 UNITS**
This course covers advanced methods in setup and operation of CNC turning centers. Emphasis is placed on programming and production of complex parts. Upon completion, students should be able to demonstrate skills in programming, operations, and setup of CNC turning centers.

MAC 224 Advanced CNC Milling **2.0 UNITS**
This course covers advanced methods in setup and operation of CNC machining centers. Emphasis is placed on programming and production of complex parts. Upon completion, students should be able to demonstrate skills in programming, operations, and setup of CNC machining centers.

MAC 228 Advanced CNC Processes **3.0 UNITS**
This course covers advanced programming, setup, and operation of CNC turning centers and CNC milling centers. Topics include advanced programming formats, control functions, program editing, and part production and inspection. Upon completion, students should be able to manufacture complex parts using CNC turning and milling centers.

MAC 231 CAM: Computer Numerical Control Turning **3.0 UNITS**
This course introduces Computer Numerical Control graphics programming and concepts for turning center applications. Emphasis is placed on the interaction of menus to develop a shape file in a graphics CAM system and to develop tool path geometry and part geometry. Upon completion, students should be able to develop a job plan using CAM software, including machine selection, tool selection, operational sequence, speed, feed, and cutting depth.

MAC 232 CAM: Computer Numerical Control Milling **3.0 UNITS**
This course introduces Computer Numerical Control graphics programming and concepts for machining center applications. Emphasis is placed on developing a shape file in a graphics CAM system and transferring coded information from CAM graphics to the CNC milling center. Upon completion, students should be able to develop a complete job plan using CAM software to create a multi-axis CNC program.

MAC 241 Jigs & Fixtures I **4.0 UNITS**

This course introduces the application and use of jigs and fixtures. Emphasis is placed on design and manufacture of simple jigs and fixtures. Upon completion, students should be able to design and build simple jigs and fixtures.