

Machining (MAC)

MAC 111AB. Machining Technology I. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, drilling machines, saws, milling machines, bench grinders, and layout instruments. Upon completion, students should be able to safely perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. This course emphasizes engine lathe setup and operation.

MAC 111BB. Machining Technology I. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-6.0. Work-0.0

This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, drilling machines, saws, milling machines, bench grinders, and layout instruments. Upon completion, students should be able to safely perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. This is the second part of a course sequence and emphasizes milling machine setup and operation.

MAC 111. Machining Technology I. 6.0 Credits. Class-2.0. Clinical-0.0. Lab-12.0. Work-0.0

This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, drilling machines, saws, milling machines, bench grinders, and layout instruments. Upon completion, students should be able to safely perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. This course emphasizes milling machine setup and operation.

MAC 114. Introduction to Metrology. 2.0 Credits. Class-2.0. Clinical-0.0. Lab-0.0. Work-0.0

This course introduces the care and use of precision measuring instruments. Emphasis is placed on the inspection of machine parts and use of a wide variety of measuring instruments. Upon completion, students should be able to demonstrate the correct use of measuring instruments.

MAC 121. Introduction to CNC. 2.0 Credits. Class-2.0. Clinical-0.0. Lab-0.0. Work-0.0

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 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

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.

Prerequisites: Take MAC 121

MAC 124. CNC Milling. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

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.

Prerequisites: Take MAC 121

MAC 131. Blueprint Reading-Machining I. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

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 132. Blueprint Reading-Machining II. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

This course introduces more complex industrial blueprints. Emphasis is placed on auxiliary views, section views, violations of true project, special views, applications of GD & T, and interpretation of complex parts. Upon completion, students should be able to read and interpret complex industrial blueprints.

Prerequisites: Take MAC 131 with a minimum grade of C

MAC 142. Machining Applications II. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

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. Prerequisites: Complete one of the following options: Take MAC 111AB, MAC 111BB, and MAC 114 with a minimum grade of C
Take MAC 111AB, MAC 111BB, and ISC 212 with a minimum grade of C

MAC 143. Machining Applications III. 4.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

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.

Prerequisites: Take MAC 122, MAC 124, and MAC 142 Minimum grade C

MAC 151. Machining Calculations. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

This course introduces basic calculations as they relate to machining occupations. Emphasis is placed on basic calculations and their applications in the machine shop. Upon completion, students should be able to perform basic shop calculations.

MAC 152. Advanced Machining Calculations. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

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.

Prerequisites: Take MAT 110 or MAT 121

MAC 192. Selected Topics in MacHining. 2.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course provides an opportunity to explore areas of current interest in the specific program or discipline areas. Emphasis is placed on subject matter appropriate to the program or discipline. Upon completion, students should be able to demonstrate an understanding of the specific area of study.

Machining (MAC)

MAC 222. Advanced CNC Turning. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

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. 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.

Prerequisites: Take MAC 122

MAC 224. Advanced CNC Milling. 2.0 Credits. Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

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.

Prerequisites: Take MAC 124

MAC 228. Advanced CNC Processes. 3.0 Credits. Class-2.0. Clinical-0.0. Lab-3.0. Work-0.0

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.

Prerequisites: Take MAC 232

MAC 231. Cam: Computer Numerical Control Turning. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-4.0. Work-0.0

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. Students will write transfer machine code from CAM graphics to the CNC turning center.

Prerequisites: Take MAC 122

MAC 232. CAM: Computer Numerical Control Milling. 3.0 Credits. Class-1.0. Clinical-0.0. Lab-4.0. Work-0.0

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.

Prerequisites: Take MAC 124

MAC 234. Advanced Multi-Axis Machining. 3.0 Credits. Class-2.0. Clinical-0.0. Lab-3.0. Work-0.0

This course includes multi-axis machining using machining centers with multi-axis capabilities. Emphasis is placed on generation of machining center input with a CAM system and setup of pallet changer and rotary system for multi-axis machining fixtures. Upon completion, students should be able to convert CAD to output for multi-axis machining centers, including tooling, setup, and debugging processes.

Prerequisites: Take MAC 232 Minimum grade C

MAC 292. Selected Topics in MacHining. 2.0 Credits. Class-2.0. Clinical-0.0. Lab-6.0. Work-0.0

This course provides an opportunity to explore areas of current interest in specific program or discipline areas. Emphasis is placed on subject matter appropriate to the program or discipline. Upon completion, students should be able to demonstrate an understanding of the specific area of study.