

MACHINE TOOL TECHNOLOGY (MACH)

MACH1000 | Machine Shop Fundamentals | Laboratory (2 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

MACH1110 | Machine Tool Fundamentals Lab | Laboratory (5 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

Corequisite(s): MACH1120

MACH1120 | Machine Tool Fundamentals Theory | Lecture (4 Credits)

Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

Corequisite(s): MACH1110

MACH1200 | Machine Shop Fundamentals | Laboratory (3 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

MACH1205 | CNC Machining Theory | Lecture (4 Credits)

Identification, recognition and calculations associated with CNC milling and turning operations, inspection of finished parts, and an introduction to the G & M codes used in CNC programming.

Prerequisite(s): MACH1000

Corequisite(s): MACH1215

MACH1210 | Advanced Machining Lab | Laboratory (5 Credits)

Advanced manufacturing of parts through layout, bench work and job planning. Advanced manual turning and milling and an introduction to CNC M & G codes. CNC portion includes manual programming via machine control and software simulation.

Prerequisite(s): MACH1110

Corequisite(s): MACH1220

MACH1215 | CNC Machining Lab | Laboratory (2 Credits)

Manufacturing of parts using CNC milling and turning processes. CNC setup and programming includes manual programming via machine control and software simulation.

Prerequisite(s): MACH1000

Corequisite(s): MACH1205

MACH1220 | Advanced Machining Theory | Lecture (4 Credits)

Identification, recognition and calculations associated with advanced milling and turning operations, inspection of finished parts and an introduction to the G & M codes used in CNC programming. CNC portion includes manual programming in notepad and Immersive software simulation.

Prerequisite(s): MACH1120

Corequisite(s): MACH1210

MACH2110 | CNC Lathe, Mill & Mold Making Lab | Laboratory (5 Credits)

Advanced manufacturing processes using CNC lathes, CNC mill and EDM, design and build of an injection mold, along with hand and inspection tool techniques.

Prerequisite(s): MACH1210

Corequisite(s): MACH2120 MACH2130

MACH2120 | CNC Lathe & Mill Theory | Lecture (2 Credits)

Advanced CNC mill programming and introduction to CNC lathe programming. G & M codes, canned cycles, jigs, fixtures and work holding methods.

Prerequisite(s): MACH1220

Corequisite(s): MACH2110

MACH2130 | Mold Design Theory | Lecture (2 Credits)

Mold making methods and industry standard practices, history and uses. Design of one injection mold from concept to finished prints. Includes mold steels, press operation, molding cycle and inspection of finished parts.

Prerequisite(s): MACH1220

Corequisite(s): MACH2110

MACH2140 | MasterCAM I | Lecture (4 Credits)

2D and 3D geometry and surface model creation using MasterCAM software, an associative computer-aided manufacturing system for milling and turning. M and G code programs will be created, debugged and simulated cutter paths run for simple part geometries.

Prerequisite(s): MDES1110

MACH2210 | CNC Mill, EDM & Die Making Lab | Laboratory (5 Credits)

Advanced manufacturing processes using CNC lathe, CNC mill, wire EDM and sinker EDM. Design and build a complete blanking die, along with hand and inspection tool techniques to ensure proper fits and finishes. Explore the set up and operation of 4 axis machine tool.

Corequisite(s): MACH2220

MACH2220 | CNC Mill & EDM Theory | Lecture (2 Credits)

Advanced work holding principles, 4 axis CNC programming, axis definitions, wire EDM programming and power definitions.

Prerequisite(s): MACH1220

Corequisite(s): MACH2210

MACH2230 | Die Design Theory | Lecture (2 Credits)

Die design fundamentals and components including bend tolerances, cutting clearances, tonnage calculations, forming, and fits and clearances for dies.

Prerequisite(s): MACH1220

MACH2240 | MasterCAM II | Lecture (4 Credits)

Advanced 3D design, surface and solid model creation using MasterCAM. Tool path creation and posting for both 2D and 3D geometry including advanced surface and solid models. Lathe part creation and programming in 2D.

Prerequisite(s): MACH2140