

MACHINE TECHNOLOGY (MACH)

MACH-150 Machining Technology Theory I **6 Credits**

Lecture: 6 hours per week

Offering: Fall Only, All Years

This course consists of learning machining related terminology, measuring systems, measuring tool usage, cutter types, and cutter geometry. Some of the instruments used are hand tools, measuring instruments, lathes, mills, and bench grinders. Students will use shop math for problem solving.

Corequisites: MACH-151L, MACH-171, MCTE-105

MACH-151L Machining Technology Lab I **6 Credits**

Lab: 18 hours per week

Offering: Fall Only, All Years

This course consists of machining projects designed to promote machining skills on all shop machinery and hand tools. Projects are graded to assure that blueprint tolerances are met. Skills learned in theory sessions are transferred to the lab through projects. CNC operation and set-up including G-Code reading and writing is practiced during this lab as well.

Corequisites: MACH-150, MACH-171, MCTE-105

MACH-152L Machining Technology Lab II **5 Credits**

Lab: 15 hours per week

Offering: Spring Only, All Years

This course consists of machining projects with more advanced skills and competencies than MACH-151L. Projects are graded to assure that blueprint tolerances are met. Skills learned in theory sessions are used in project planning and execution. Students will use shop math and project planning problem solving. This also includes basic CNC operation, along with learning to read and writing G-code.

Prerequisites: MACH-150, MACH-151L, MACH-171, MCTE-105

Corequisites: MACH-160, MACH-172

MACH-153 Precision Measuring **1 Credit**

Lecture: 1 hour per week

Offering: Fall Only, All Years

This course consists of learning terminology, measuring systems, and using measuring tools. Instruments used include hand tools, micrometers, calipers, scales, height gauges, and other measuring devices. Success is dependent on being able to read precision measuring instruments and applying it to real manufactured parts as related to the machining industry.

MACH-160 Manufacturing Processes **4 Credits**

Lecture: 4 hours per week

Offering: Spring Only, All Years

This course is a continuation of MACH-150 learning more advanced machining concepts, techniques and set-ups, with an emphasis placed on project planning and execution. Students will use shop math for problem solving and project planning. Students will also learn to read and write G-code along with controller functions.

Prerequisites: MACH-150, MACH-151L, MACH-171, MCTE-105

Corequisites: MACH-152L, MACH-172

MACH-171 Blueprint Reading **2 Credits**

Lecture: 2 hours per week

Offering: Fall Only, All Years

This course is an introduction to identifying blueprint information needed to produce a machined part through the interpretation of lines, symbols, and numbers as shown on two and three view orthographic drawings. During the discussion of tolerances, basic geometric dimensioning and tolerancing will be introduced.

Corequisites: MACH-150, MACH-151L, MCTE-105

MACH-172 Blueprint Reading II **2 Credits**

Lecture: 2 hours per week

Offering: Spring Only, All Years

This course is a continuation of MACH-171 with an emphasis on more complex prints, geometric dimensioning, and tolerancing. Interpreting blueprints with more advanced concepts needed to produce machined parts.

Prerequisites: MACH-171

Corequisites: MACH-152L, MACH-160

MACH-201 Design for Manufacturing **1 Credit**

Lecture: 1 hour per week

Offering: Spring Only, All Years

This course will expose Computer Aided Design Technology - Mechanical students to basic manufacturing processes, concepts, and principles that will help prepare them with skills needed in the mechanical design industry. Students will be exposed to various manufacturing methods including machining, casting, welding, prototyping, and composites.

MACH-230 Tools in Manufacturing **1 Credit**

Lecture: 1 hour per week

Offering: Fall Only, All Years

This course covers basic manufacturing related terminology, safety, measuring systems, usage of measuring tools, cutting tools and cutting tool geometry used in manufacturing. Students will become familiar with hand tools, precision measuring instruments, lathes, mills, and bench grinders.

MACH-234 Computers in Machining**2 Credits****Lecture:** 1 hour per week, **Lab:** 2 hours per week**Offering:** Fall Only, All Years

This course is designed to provide students with extensive experience with CAD/CAM systems. Students will use PCs to prepare for employment in the computerized manufacturing workplace with the opportunity to become certified in Master CAM Mill. Students will also explore other software applications commonly used in the workplace.

MACH-253L Computer Numerical Control Lab**5 Credits****Lab:** 15 hours per week**Offering:** Fall Only, All Years

This course is a hands-on learning experience using tools and techniques discussed in MACH-130 and MACH-283. Students will develop code for and gain experience on such machines as CNC lathes and CNC mills.

Corequisites: MACH-283**MACH-254L Advanced Computer Numerical Control Lab****5 Credits****Lab:** 15 hours per week**Offering:** Spring Only, All Years

This course offers hands-on experience under work-like conditions and in depth CNC and manual projects that build on skills acquired in MACH-253L. Upon successful completion of this course, students should have the necessary skills to be employed as an entry level CNC machinist.

Prerequisites: MACH-234, MACH-253L, MACH-273, MACH-283**Corequisites:** MACH-284**MACH-273 Blueprints in Manufacturing****3 Credits****Lecture:** 3 hours per week**Offering:** Fall Only, All Years

This course will teach students to interpret drawings, sketches, and blueprints as well as create drawings with dimensions and information necessary to complete projects. Application of section views, detailed views, complex drawings, and methods of drawing parts to illustrate features will also be examined.

MACH-274 Geometric Dimensioning and Tolerancing**3 Credits****Lecture:** 3 hours per week**Offering:** Spring Only, All Years

This course introduces students to the concepts used in the machine trades known as geometric dimensioning and tolerancing. It builds on prior knowledge of blueprints and machined parts and applies that knowledge to "geometric toleranced" drawings. Students will learn the terminology and definitions of geometric dimensioning and tolerancing and how to apply its concepts.

MACH-283 Computer Numerical Control**5 Credits****Lecture:** 5 hours per week**Offering:** Fall Only, All Years

This course introduces students to the standard practices and methods used in CNC machining for the CNC lathe and CNC milling machine. Students will be familiarized with the different types of controls and machines. Students will also learn basic programming, setup, and part production.

Corequisites: MACH-253L**MACH-284 Advanced Numerical Control****5 Credits****Lecture:** 5 hours per week**Offering:** Spring Only, All Years

This course will teach students more complex methods and setups as well as be exposed to other types of CNC machines. They will also learn precision grinding and finishing skills, tool and cutter grinding, fixturing, and production planning.

Prerequisites: MACH-234, MACH-253L, MACH-273, MACH-283**Corequisites:** MACH-254L