

# MACHINE TOOL TECHNOLOGY (MACH)

## **MACH 103 Machine Shop Laboratory I**

(3 Credits, Fall)

Practice basic setup, safety, operation, and maintenance of the engine lathe machine. Prepare for operations utilized in the advanced lathe practice labs, including setup and operation of supporting equipment. PREREQ: Machine Tool Technology major. COREQ: MACH 104, MACH 126, MACH 153, and MACH 154. (0 lecture hours, 9 lab hours, 3 credits)

## **MACH 104 Machine Shop Laboratory II**

(3 Credits, Fall)

Introduction to the operation of milling machines. Includes safety practices, setup and maintenance, and manipulation of all controls. Also includes instruction and practice using supporting equipment. COREQ: MACH 103, MACH 126, MACH 153, and MACH 154. (0 lecture hours, 9 lab hours, 3 credits)

## **MACH 105 Machine Shop Laboratory III**

(6 Credits, Spring)

Laboratory component to Machine Shop Theory III (MACH 155). PREREQ: MACH 103, MACH 104, MACH 126, MACH 153, and MACH 154. COREQ: MACH 127, MACH 155, and MACH 224. (0 lecture hours, 18 lab hours, 6 credits)

## **MACH 126 Related Blueprint Reading I**

(2 Credits, Fall)

Learn the basic principles and techniques of reading orthographic projection drawings and technical sketching as it applies to machine shop projects and tasks. Includes the use of geometric and trigonometric principles in solving problems related to machining. COREQ: MACH 103, MACH 104, MACH 153, and MACH 154. (2 lecture hours, 0 lab hours, 2 credits)

## **MACH 127 Related Blueprint Reading II**

(2 Credits, Spring)

Introduction to the advanced principles needed to interpret more complicated machine shop detail and assembly drawings with an emphasis on machining specifications and materials. Includes the use of Geometric Dimensioning and Tolerancing (GD&T) and the Machinery's Handbook in interpreting blueprint specifications and associated machining processes. PREREQ: MACH 103, MACH 104, MACH 126, MACH 153, and MACH 154. COREQ: MACH 105, MACH 155, and MACH 224. (2 lecture hours, 0 lab hours, 2 credits)

## **MACH 153 Machine Shop Theory I**

(2 Credits, Fall)

Study of conventional lathe operations including facing, turning, boring, grooving, knurling, and thread and taper cutting. Also includes the setup and operation of supporting equipment. COREQ: MACH 103, MACH 104, MACH 126, and MACH 154. (2 lecture hours, 0 lab hours, 2 credits)

## **MACH 154 Machine Shop Theory II**

(2 Credits, Fall)

Study of various milling operations, including milling machines and the devices that attach to these mills for various operations. Also includes the setup and operation of support equipment. COREQ: MACH 103, MACH 104, MACH 126, and MACH 153. (2 lecture hours, 0 lab hours, 2 credits)

## **MACH 155 Machine Shop Theory III**

(2 Credits, Spring)

Theory of machining processes and their applications (as practiced in the corequisite lab course [MACH 105]) with safe work habits being emphasized in all phases of instruction. Includes setup, operation, and maintenance of manual milling machines, advanced manual engine lathe set-up techniques and operations, and precision surface grinding and measuring techniques. PREREQ: MACH 103, MACH 104, MACH 126, MACH 153, and MACH 154. COREQ: MACH 105, MACH 127, and MACH 224. (2 lecture hours, 0 lab hours, 2 credits)

## **MACH 199 Machine Tool Technology Special Topics**

(1-5 Credits, Varies)

This course is designed to permit the offering of special topics appropriate to a student's program. Regular or frequently recurring topics are not offered under this title. The course may be repeated as new topics are presented. (1 lecture hours, 0 lab hours, 1 credits)

## **MACH 203 Advanced Machine Shop Laboratory I**

(6 Credits, Fall)

Laboratory component to Advanced Machine Shop Theory I (MACH 253). PREREQ: MACH 105, MACH 127, MACH 155, and MACH 224. COREQ: MACH 212 and MACH 253. (0 lecture hours, 18 lab hours, 6 credits)

## **MACH 204 Advanced Machine Shop Laboratory II**

(6 Credits, Spring)

Laboratory component to Advanced Machine Shop Theory II (MACH 254). PREREQ: MACH 203, MACH 212, and MACH 253. COREQ: MACH 210 and MACH 254. (0 lecture hours, 18 lab hours, 6 credits)

## **MACH 210 Fundamentals of Computer-Aided Drafting and Design**

(3 Credits, Spring)

Introduction to computer-aided drafting and design systems, aimed at preparing students for keyboarding, operating the systems, and understanding the applications of computer graphics to machine standards. Students will use interactive graphics systems to prepare drawings on computer displays. PREREQ: MACH 203, MACH 212, and MACH 253. COREQ: MACH 204 and MACH 254. (3 lecture hours, 0 lab hours, 3 credits)

## **MACH 212 Computer-Aided Manufacturing**

(3 Credits, Fall)

Learn to write computer numerical control (CNC) machine tool programs using computer-assisted techniques to generate G-Code and M-Function programs. Topics include tooling concepts; machining methods; definition of part geometry; writing of tool motion statements; use of the computer to process program inputs, analysis; and debugging of computer outputs to develop a functional program. PREREQ: MACH 105, MACH 127, MACH 155, and MACH 224. COREQ: MACH 203 and MACH 253. (3 lecture hours, 0 lab hours, 3 credits)

## **MACH 224 Tool Design for Manufacturing**

(2 Credits, Spring)

Examination of process planning for manufacturing, tool and hardware selection, and advanced setup techniques. Includes jig and fixture design for production machining. PREREQ: MACH 103, MACH 104, MACH 126, MACH 153, and MACH 154. COREQ: MACH 105, MACH 127, and MACH 155. (2 lecture hours, 0 lab hours, 2 credits)

**MACH 253 Advanced Machine Shop Theory I**

(3 Credits, Fall)

Introduction to basic programming skills and operation of computer numerical control (CNC) machining centers with an emphasis on manually writing G&M code compatible programs, debugging programs, setups and fixturing, tooling, offset calculations, and operating CNC machining centers. Includes inspection of manufactured parts using a Coordinate Measuring Machine (CMM). PREREQ: MACH 105, MACH 127, MACH 155, and MACH 224. COREQ: MACH 203 and MACH 212. (3 lecture hours, 0 lab hours, 3 credits)

**MACH 254 Advanced Machine Shop Theory II**

(3 Credits, Spring)

Introduction to basic programming and operation of computer numerical control (CNC) turning centers. Emphasis on manually writing G & M code compatible programs, setups and fixturing, tooling, offset calculations, and debugging programs. PREREQ: MACH 203, MACH 212, and MACH 253. COREQ: MACH 204 and MACH 210. (3 lecture hours, 0 lab hours, 3 credits)

*Refer to How to Read Course Descriptions for an explanation of elements found in the course descriptions above.*