various companies utilize CNC machine tools. The student will become acquainted with the ways in which operation of common operating procedures, set-up and maintenance and troubleshooting are handled. This course is an introduction to CNC Turning Centers and the safe use of essential machine shop tools and demonstrating safe and correct practices and proper use. During this class students will be trained in basic operation of metal lathes, milling machines, pedestal/bench grinders, saws, and drill presses. This course is also an introduction to measurement, materials, job planning, bench work and layout will be presented.

MCH 232 CNC Lathe Operation Level II: 3 Credits (3 Lab)
PREREQUISITE: MCH 231. MCH 232, CNC Lathe Operation Level II, reinforces student’s understanding of CNC Lathe operation and programming developed in MCH 231. Concepts to be covered include program planning (setup sheets, tool setup, offsets) metrology, program trouble shooting and intro to bar pulling.

MCH 234 CNC Milling Operations Level I: 3 Credits (6 Lab)
This course is an introduction to CNC Milling Centers. The common operating procedures, set-up, and maintenance of the machine and control panel will be introduced and implemented. The student will become acquainted with the way CNC machine tools are utilized, while learning programming setup and operations, methods for the installation of tools, establishing machine, fixture, and part zero reference offsets.

MCH 235 CNC Milling Programmer Level II: 3 Credits (3 Lab)
PREREQUISITE: MCH 234. MCH 235, CNC Mill Programmer Level II, reinforces student’s understanding of CNC Mill operation and programming. Concepts to be covered include program planning, setup sheets, tool setup, offsets, metrology and intro to fourth axis.

MCH 242 CNC Probing and Macros: 3 Credits (2 Lec, 1 Lab)
PREREQUISITE: MCH 234 or ETME 410. MCH 242 introduces students to the advanced capabilities of CNC machine tools. In this course students will learn how to use macros and probing to automate processes including part location and size, program loading based on condition, fixture orientation, tools offset modification, tool setting, part measurement, and program selection based on fixtures.

MCH 247 CNC Robotic Integration 1: 3 Credits (1 Lec, 2 Lab)
(Su) MCH 247 introduces students to the concepts and equipment necessary to design and setup an industrial robotic system for basic CNC machine tending. This is a hands-on group problem-solving class requiring prior CNC operation and programming experience.

MCH 260 Machine Shop II: 3 Credits (1 Lec, 2 Lab)
PREREQUISITE: MCH 160 or MCH 130. Machine Shop 2 Reinforces through practice common skills used in a modern machining shop. Through practical lab exercises, the student will utilize common and essential machine shop tools and demonstrating safe and correct practices and proper use. During this class students will apply basic operation of metal lathes, milling machines, pedestal/bench grinders, saws, and drill presses. During this course the students will be required to complete 2 National Institute of Metalworking Skills Certifications. Students will be exposed to additional machining skills not covered in MCH 160. This course will also reinforce basic measurement and print reading skills.

Repeatable up to 6 credits.

MCH 291 Special Topics: 3 Credits (3 Lec)
Repeatable up to 3 credits.

MCH 292 Independent Study: 1-3 Credits (1-3 Lab)
The MCH 292 Independent Study is a one to three credit course that teaches to the specific goals of the student. This course builds on the MCH foundation to increase skill development in general machining processes and fabrication skills.