MCH - Machining & Manufacturing Tech

MCH 103 Intro to Computer Aided Manufacturing Lvl 1 Level 1 Immerse 2Learn: 2 Credits (2 Lec)
This is an online course run through the Immerse 2Learn platform that supports all the hands on activities offered in the CAS CNC Machine Technology program. Course will be supported by faculty in the CNC program.

MCH 104 Introduction to Computer Aided Manufacturing Level II: 2 Credits (2 Lec)
PREREQUISITES: MCH 103. This class is a blended online and lecture to provide an online tutorial for CNC Machining on a Haas GUI interface. This class will serve to reinforce basic machine setup, and programing skills introduced in other classes

MCH 109 Mathematics for CNC Machining: 3 Credits (3 Lec)
MCH 109 is a technical mathematics course taught in the context of CNC Machining with a focus on real world problems encountered by machinists and manufacturing shop management.

MCH 120 Blueprint Reading: 2 Credits (2 Lec)
This is a face to face course introducing the fundamental concepts necessary to interpret drawings and produce sketches for machine tool applications as applied to CNC Machining. Topics include advanced sectioning, geometric dimensioning, geometric tolerance, assembly and drawing.

MCH 122 Introduction to CAM: 3 Credits (3 Lec)
MCH 122, Intro to CAM, is designed to give students practical experience in the application of a Computer Aided Machining Program to create production code for CNC Mills and Lathes. The class includes basic CAM drafting practices, Coordinate Systems, Modeling (surface and solid) and tool development.
Repeatable up to 6 credits.

MCH 130 Machine Shop: 3 Credits (1 Lec, 4 Lab)
he content covers a broad range of manual and CNC machining with the emphasis on shop and work area safety. The course will include an introduction to measurment and materials. Job planning, bench work and layout will be presented.

MCH 160 Machine Shop Level 1: 3 Credits (1 Lec, 2 Lab)
Machine Shop 1 introduces students to the common shop equipment used in the modern machining and manufacturing. Through a combination of lectures and practical lab exercises, the student will utilize common and essential machine shop tools and develop safe and correct practices thru proper use. During this class students will be trained in basic operation of metal lathes, Milling machines, pedestal/bench grinders, saws, and drill press. This course is also an introduction to measurement, materials, job planning, bench work and precision layout.

MCH 220 Geometric Dimensioning and Tolerancing Metrology: 3 Credits (2 Lec, 1 Lab)
(Sp) Open to all Gallatin College students, except AA and AS students. This course is designed to introduce students to the principles of Geometric Dimensioning and Tolerancing related to the machining industry. The theory principles will be enforced through exercises in the CNC lab. Students will also be introduced to a CMM.

MCH 230 Tooling and Work Holding for CNC: 3 Credits (2 Lec, 1 Other)
MCH 230, Tooling and Fixturing is a course designed to introduce students to the wide variety and complexity of work holding and tooling available for CNC Machining. This class will discuss tool design/shape and its effects on machining. Work holding and its effect on part density, repeatability and rigidity will also be discussed.

MCH 231 CNC Turning Operations Level I: 3 Credits (6 Lab)
This course is an introduction to CNC Turning Centers and the safe operation of common operating procedures, set-up and maintenance and control panel. The student will become acquainted with the ways in which various companies utilize CNC machine tools.

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 248 Tooling and Work Holding for Robotic Tending: 3 Credits (2 Lec, 1 Lab)
PREREQUISITE: DDSN 135 or consent of instructor. (F) MCH 248 Tooling and Work holding for Robotic Tending is designed to introduce students to various work holding and tooling for Robotic Machining Tending and support processes. Students will also learn to develop custom tooling for robotic tending

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.