

METALS & MACHINING TECHNOLOGY (MCH)

MCH 101 - Introduction to Manufacturing Processes. 1 Credit.

Offered autumn. Offered at Missoula College. This course is designed to introduce the student with an overview of manufacturing to include engineering materials and product attributes, material removal processes, property enhancing and surface processing operations, special processes and assembly technologies, and manufacturing systems.

MCH 102 - Introduction to Manufacturing Materials. 2 Credits.

Offered spring. Offered at Missoula College. This is an introductory course in the study of materials used in the manufacturing industry. Topics include selection and identification of steels, selection and identification of nonferrous metals, mechanical behavior of various plastics, hardening, case hardening, tempering, annealing, normalizing, stress relieving, and the use of the Rockwell and Brinell hardness testers.

MCH 112 - Related Metals Processes I. 1 Credit.

Offered spring. Offered at Missoula College. Use of hand tools and machines which relate to the repair of heavy equipment. Instruction covers fasteners, layout, bench metal, threads and threading, drills and drilling, and tool sharpening.

MCH 114 - Related Metals Processes II. 3 Credits.

Offered autumn. Offered at Missoula College. Instruction and use of drills, files, threads and threading processes, basic lathe, drill press, and band saw operation, including precision measuring instruments. Fasteners, layout procedures, and basic hand tools are covered.

MCH 115 - Related Metals Processes III. 3 Credits.

Offered spring. Offered at Missoula College. A basic metalworking course covering fasteners, layout, bench metal, heat treating, threads and threading, drills and drilling, basic machining, and tool sharpening.

MCH 120 - Blueprint Reading & Interpretation for Machining. 3 Credits.

Offered autumn. Offered at Missoula College. This course introduces the fundamental concepts necessary to interpret and make drawings with symbols, various schematics and diagrams, dimensioning techniques, section views, auxiliary views, threads and fasteners, and sketching typical to all shop drawings. Interpretation of specifications and determination of acceptable tolerance requirements to ensure quality control measures for design parts will also be stressed.

MCH 122 - Introduction to CAM. 3 Credits.

Offered spring. Offered at Missoula College. This course introduces Computer Aided Manufacturing (CAM) operational basics for both mill and lathe programming using current CAM software. The course includes terminology relevant to PC-based CAD/CAM work, hardware familiarity, system operation and management, folders, file type and structure, menu structure and use, and 3 axis (milling machines) and 2 axis (lathes) tool paths. Emphasis is placed on proper geometric creation, management, relevant utilities, and toolbar and menu functions.

MCH 125 - Introduction to CNC Lathes. 3 Credits.

Offered spring. Offered at Missoula College. Prereq., MCH 132. This course provides opportunities for students to develop skills in the safe setup, maintenance, and operation of CNC lathes and related periphery tools and skills. Topics covered include CNC lathe parts, controls, tool holding, tool insert geometry, chip formation, speeds and feeds, operation and process planning, threads, fits, dimensioning and tolerances, surface finish, and the following lathe processes: facing, turning, tapering, drilling, boring, reaming, chamfering, grooving, parting-off, internal and external threading, tapering, and knurling. Graded projects based on chuck, collet, and fixturing will be done. Related periphery tooling, use and care of precision measuring tools, in addition to related math used in the trade, will also be covered.

MCH 127 - Introduction to CNC Mills. 3 Credits.

Offered spring. Offered at Missoula College. Prereq., MCH 134. This course provides instruction in the setup and operation of CNC mills. Student projects include specialty tooling and multi-axis machining. Students will also gain experience in process control. Topics include specialty tooling, multi-axis machining, process control, and laboratory exercises in part production.

MCH 129 - Machine Quality Control and Precision Measurements. 3 Credits.

Offered autumn. Offered at Missoula College. Students will develop the knowledge to analyze and evaluate the processes and methodology required in an industrial production environment to determine whether quality control standards are being met. Topics include use of non-precision measuring tools, use of precision measuring tools, use of comparison gauges, and analysis of measurements in a CNC environment.

MCH 130 - Machine Shop. 3 Credits.

Offered spring. Offered at Missoula College. The course content covers a broad range of shop fundamentals in manual and CNC machining. This course includes an emphasis on shop and work area safety. Instruction covers standard shop work, such as measurement, layout, basic hand tools, drills, drill presses, and taps and dies. Use of pedestal grinder will be covered. Work assignments incorporate projects requiring use of the above machines, tooling, and emphasizes safety.

MCH 132 - Introduction to Manual Engine Lathes. 4 Credits.

Offered autumn. Offered at Missoula College. Prereq./coreq., MCH 120 and MCH 129. This introduction to Manual Engine Lathes will cover the safety, maintenance and operation of manual engine lathes and related periphery tools and skills. Subjects covered include HSS tool bit grinding and tool bit geometry, chip formation, speeds and feeds, operation and process planning, threads, fits, dimensioning and tolerances, surface finish, and the following lathe processes: facing, turning, tapering, drilling, boring, reaming, chamfering, grooving, parting-off, internal and external threading, tapering, knurling, filing and polishing. Graded projects using between centers and chuck work turning will be done. Related periphery tooling, use and care of precision measuring tools, in addition to related math used in the trade, will also be covered.

MCH 134 - Introduction to Manual Mills. 4 Credits.

Offered autumn. Offered at Missoula College. Prereq./co-req., MCH 120 and MCH 129. The student will perform advanced hands-on machine shop operations: set up and operation of manual milling machines, drill presses, band saws, grinders, and other equipment commonly found in manufacturing facilities. The student will use precision measuring tools and methods, utilize blueprints, and perform project process planning. Various types of steel and aluminum are use.

MCH 191 - Special Topics. 1-6 Credits.

(R-6). Offered intermittently. Offered at Missoula College.

MCH 196 - Independent Study Variable. 1-6 Credits.

(R-6) Offered intermittently. Offered at Missoula College. Course material appropriate to the needs and objectives of the individual student.

MCH 198 - Internship. 1-6 Credits.

Offered at Missoula College. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

MCH 214 - Advanced Related Metals Proc. 3 Credits.

Offered autumn. Offered at Missoula College. Advanced skill development using machine tools such as milling machines, lathes, surface grinders, and drill presses, emphasizing safety. Welding and machining are used together demonstrating how sequencing work improves quality and productivity.

MCH 292 - Independent Study. 1-6 Credits.

(R-6) Offered intermittently. Offered at Missoula College.