

# MANUFACTURING TECHNOLOGIES (MFG)

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## **MFG 104 - Fluid Power**

**Credit Hours: 3, Contact Hours: 4**

Division: Technical

The Fluid Power course is designed to provide students with a basic understanding of the concepts and applications of fluid power technology and the necessary skills for further study in the field. The course is an overview of fluid power technology applications; the general concept of fluid power systems; an introduction to energy input, energy output, energy control, and systems auxiliary components; as well as the design and function of components. As part of this course, students will earn an IFPS Connector and Conductor certification. Group 2 course. Critical Thinking - Direct, Quantitative Reasoning.

Recommended Prerequisite(s): Placement into MTH 111 and ENG 99/108

## **MFG 111 - Math for Manufacturing**

**Credit Hours: 3, Contact Hours: 3**

Division: Technical

This course will apply principles of mathematics, geometry, and basic trigonometry to applications in manufacturing. Topics will include proportions, calculation of machine speed and feed and geometric relationships of triangles and circles. Problem solving will require the use of the Pythagorean Theorem and the sine, cosine, and tangent functions to solve right triangles. The Law of Sines and Law of Cosines will be used to solve oblique triangle applications. Group 2 course. Quantitative Reasoning.

## **MFG 113 - Machining I**

**Credit Hours: 3, Contact Hours: 5**

Division: Technical

The student will be introduced to measurement and the safe use of layout and bench tools, drill press operations, and basic lathe facing and turning operations. Basic vertical milling operations will also be included. Group 2 course. Students will greatly benefit from having competency up to MTH 111. Critical Thinking - Direct.

Recommended Prerequisite(s): Print reading, precision measurement, basic machining knowledge and skills, competencies in Communications equal to ENG99 and math equal to MTH23

## **MFG 114 - Machining II**

**Credit Hours: 3, Contact Hours: 5**

Division: Technical

This course will introduce students to machining procedures beyond the basic operations. The student should have previously acquired basic machining knowledge and skills. Lathe procedures will include threading and cutting tapers. Milling operations will include the offset boring head, and broaching. Precision grinding of parallel and angular surfaces using gauge blocks and a sine bar will be introduced. Students will study the process and perform hands on operations. Group 2 course. Critical Thinking - Direct.

Required Prerequisite(s): MFG 113 or MNG 260 Students will greatly benefit from having competency up to MTH 111

Recommended Prerequisite(s): Print reading, precision measurement, basic machining knowledge and skills, competencies in Communications equal to ENG 99/108 and Math equal to MTH 23

## **MFG 203 - Manuf/Engineering Processes**

**Credit Hours: 3, Contact Hours: 4**

Division: Technical

The Manufacturing and Engineering Processes course will provide students with an overview of various processes used in the design and development of new products. Students will be introduced to the engineering steps and processes required to take a product from concept through production. This is a project-based class in which students will design and fabricate a component aligned with their area of interest.

Group 2 course. Critical Thinking - Direct.

Required Prerequisite(s): DD 170, ENG 99/108, MTH 23

## **MFG 217 - CNC Operations - Lathe**

**Credit Hours: 4, Contact Hours: 6**

Division: Technical

This course will introduce students to CNC (Computer Numerical Control) turning machines or CNC lathes. CNC lathe procedures will include set up from a list of guidelines to properly and safely make a part to blueprint specifications. Students will spend lab time going over machine demonstrations with individual practice and support, supplemented with classroom and online learning going over safety procedures and machine set up operations. Group 2 course. Quantitative Reasoning.

Required Prerequisite(s): MFG 113

Recommended Prerequisite(s): MTH 23 or higher

## **MFG 219 - CNC Mill Operations**

**Credit Hours: 4, Contact Hours: 6**

Division: Technical

This course includes the operation of CNC (Computer Numerical Control) mills including calling up programs, loading and unloading parts, part inspection, and monitoring tool wear. This course will provide an introduction to planning and writing programs for CNC mills and using standard G and M codes. Learners will set up work pieces in machines, enter programs, set tool offsets, enter work offsets, and complete part projects. Group 2 course. Quantitative Reasoning.

Recommended Prerequisite(s): MFG 113 or MNG 260

## **MFG 290 - Manufacturing Tech Internship**

**Credit Hours: 2-4, Contact Hours: 2-4**

Division: Technical

The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid, supervised on-the-job training experience. In addition to the required 50 hours per credit in a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

Required Prerequisite(s): 30 credits of program specific courses with a GPA of 2.0 or higher

**MFG 304 - Marine Hydraulics**

**Credit Hours: 3, Contact Hours: 4**

Division: Technical

Marine Hydraulics focuses on the systems, applications, hydraulics, and safety requirements specific to the marine and offshore Remote Operated Vehicle (ROV) environments. The design, repair and maintenance of launch and recovery equipment, hoses, sensors and components associated with ROV hydraulics systems will be emphasized. Students will use test equipment and protocols to develop trouble shooting methods to analyze and integrate this technology. As part of this course, students will earn an IFPS Hydraulic Specialist certification. Group 2 course. Critical Thinking - Direct.

Required Prerequisite(s): MFG 104, MTH 111 or higher, PHY 121