

# MANUFACTURING TECHNOLOGY (MFT)

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## **MFT 102 - Introduction to Manufacturing and Safety (4 Credits)**

*3 lecture, 2 lab, 5 total contact hours*

Provides the student with an introduction to the manufacturing world and provides specific instruction to facilitate safe work practices in industrial environments. Introduces manufacturing specializations such as mechatronics, precision machining and welding. Covers fire safety, pressurized gases, electrical hazards, and safe machine usage. Students will also become acquainted with OSHA policy. Students will have the opportunity to earn the Safety Certification through Manufacturing Skill Standards Council (MSSC).

**Typically offered:** Fall, Spring, Summer

## **MFT 104 - Quality and Measurement (2 Credits)**

*1 lecture, 2 lab, 3 total contact hours*

Provides an introduction to controlling and improving quality in a manufacturing setting. Explores ways that manufacturers use data and analysis to improve quality. Students will have the opportunity to earn the Quality and Measurement Certification through the Manufacturing Skill Standards Council (MSSC). Prerequisite: Prior or concurrent enrollment in MFT 102 with a grade of C or better.

**Typically offered:** Fall

## **MFT 105 - Machining Processes I (3 Credits)**

*1 lecture, 4 lab, 5 total contact hours*

Covers fundamentals of machine shop theory and safe practices. Provides familiarization with tools, equipment, and practices of the precision metal working industry. Includes introduction to mills, drill press, and lathes. Students are provided classroom and laboratory learning experiences. Students may earn NIMS credentials.

**Typically offered:** Fall, Spring

## **MFT 108 - Manufacturing Processes (3 Credits)**

*2 lecture, 2 lab, 4 total contact hours*

Provides the basics of how manufacturing transforms materials into products. Students will learn about the varying types of production and will learn about the materials that are used in production. They will become familiar with the types of processes used in manufacturing including machining, casting and assembly. Prerequisite: MFT 102 with a grade of C or better.

**Typically offered:** Spring

## **MFT 109 - Introduction to Manufacturing Maintenance (2 Credits)**

*1 lecture, 2 lab, 3 total contact hours*

Provides a basic understanding of tools and equipment used in manufacturing and knowledge of how to improve productivity through predictive and preventive maintenance.

**Typically offered:** Spring

## **MFT 119 - Manufacturing Internship (2 Credits)**

*1 lecture, 10 lab, 11 total contact hours*

Applies and expands manufacturing skills and knowledge in the workplace environment. Students will have an on-site supervisor who will assign duties in the workplace. Regularly scheduled face-to-face on-campus sessions will be conducted to assess the student's progress, problem areas, and to review appropriateness of work involvement. Actual permissible duties and activities will be determined based upon the student's knowledge and skill. Student must complete a minimum of 100 hours at the work site. Prerequisite: MFT102, MFT104, MFT108 and MFT109 with grades of C or better.

**Typically offered:** Fall, Spring, Summer

## **MFT 120 - Machining Processes II (3 Credits)**

*1 lecture, 4 lab, 5 total contact hours*

Covers machine shop theory with emphasis on safe practices and applications. Includes lathes, surface grinders, and milling machines. Projects in this class will be machined using high speed (HSS) tools. Students are responsible for calculating all feeds and speeds. Students may earn NIMS credentials. NOTE: The prerequisite will be waived for Fall 2020. Prerequisite: MFT 105 with a grade of C or better.

**Typically offered:** Fall, Spring

## **MFT 121 - Machining Processes III (3 Credits)**

*1 lecture, 4 lab, 5 total contact hours*

Covers advanced machine shop theory and applications. Includes lathes, surface grinders, and milling machines. Studies production machining, feed and speed applications, and quality control techniques applied to precision machining. Introduces modern indexable tooling. Students may earn NIMS credentials. NOTE: The prerequisite will be waived for Fall 2020. Prerequisite: MFT 120 with a grade of C or better.

**Typically offered:** Spring

## **MFT 123 - Introduction to CNC Machining (4 Credits)**

*3 lecture, 3 lab, 6 total contact hours*

Introduces setup and operation of CNC (Computer Numerical Control) machining and turning centers. Teaches CNC machine tool controls through laboratory experiences and the manufacture of preprogrammed parts including part holding techniques, alignment, process planning, tooling for CNC machine tools and inspection of machined products. Students may earn NIMS credentials.

**Typically offered:** Fall, Spring

## **MFT 125 - CNC Lathe Operation and Programming (4 Credits)**

*2 lecture, 4 lab, 6 total contact hours*

Covers the principles and operation of conventional and CNC (Computer Numerical Control) machine tools with an emphasis on the set up and operation of lathes. Includes safety, turning, grooving, drilling, boring, threading, cutting tools, and introduction to CNC programming on common industry controls. Students may earn NIMS credentials. NOTE: The prerequisite will be waived for Fall 2020. Prerequisite: MFT 123 with a grade of C or better.

**Typically offered:** Fall, Spring

## **MFT 128 - CNC Mill Operation and Programming (4 Credits)**

*2 lecture, 4 lab, 6 total contact hours*

Covers the principles and operation of conventional and CNC (Computer Numerical Control) machine tools with an emphasis on the set up and operation of vertical and horizontal mills. Includes safety, turning, drilling, boring, threading, cutting tools, to CNC programming, practices and setups on common industry controls. Students may earn NIMS credentials. Prerequisite: MFT 123 with a grade of C or better.

**Typically offered:** Fall, Spring

## **MFT 132 - Dimensional Metrology (3 Credits)**

*3 lecture, 1 lab, 4 total contact hours*

Develops dimensional measurement ability for skilled workers, inspectors, technicians, and for personnel entering a technical occupation. Measuring equipment and instruments used include: scales, micrometers, calipers, gage blocks, indicators and production gages. Basic statistics, probability, and acceptance sampling are also covered.

**MFT 134 - Print Reading for Industry (3 Credits)**

*3 lecture, 1 lab, 4 total contact hours*

Provides students in the machine trades the basic skills required for visualizing and interpreting industrial prints. Emphasizes orthographic projection techniques of top, front, side, and section views, tolerancing, geometric dimensioning and the impact of computer drafting as related to the machine trades.

**Typically offered:** Fall, Spring, Summer

**MFT 140 - Quality Assurance (3 Credits)**

*1 lecture, 4 lab, 5 total contact hours*

Provides the student with the knowledge necessary for different types of part inspections. Utilizes the Coordinate Measuring Machine (CMM), surface plate, height gages, optical comparator and other quality inspection equipment to set up and lay out parts for the final inspection process. Compares all measurements and layouts to precision part blueprints. Prerequisite: MFT 132 with a grade of C or better.

**MFT 210 - Computer Integrated Manufacturing (3 Credits)**

*2 lecture, 3 lab, 5 total contact hours*

Covers concepts of solid modeling techniques for product design and manufacturing in this introductory course. Provides students with a thorough understanding of the integration of computers and Computer Aided Drafting (CAD) software used in the industry and precision machining. Teaches how to create, modify, and manipulate part geometry. Students will create a CAD drawing of a part for precision machining.

**Typically offered:** Summer

**MFT 220 - Computer Aided Manufacturing (3 Credits)**

*2 lecture, 3 lab, 5 total contact hours*

Demonstrates the integration of Computer-Aided Design (CAD) and Computer Aided Manufacturing in this introductory course. Provides students with knowledge of programming processes using Computer-Aided Manufacturing (CAM) software combined with Computer-Aided Drafting (CAD) software used in precision machining to generate G-code for a Computer Numerical Control (CNC) program. Students will perform tooling selection, create and simulate CNC machining toolpaths, and generate CNC code to machine an actual part.

**Typically offered:** Summer

**MFT 230 - Additive Manufacturing (3 Credits)**

*2 lecture, 3 lab, 5 total contact hours*

Provides an introduction to the additive manufacturing processes and the materials used. Presents the history of additive manufacturing (commonly known as 3D printing), the role of the part designer, the principles of design thinking, the role of CAD software, advantages and disadvantages of additive manufacturing, comparison of additive manufacturing to traditional technologies, and the difference between various 3D printing technologies and materials. Prerequisite: EGR 120 or MFT 210 with a grade of C or better.