

# MACHINING TECHNOLOGIES (CMT)

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## **CMT 100 Survey of Advanced Manufacturing 5 Credits**

Introduces safe use of basic machine and hand tool practices used in common advanced manufacturing operations.

**Prerequisite:** None.

## **CMT 101 Introduction to Machining 5 Credits**

Provides an overview of the machining career including the types of machines used, history of the machining trades, overview of machining careers, and introduction to NIMS certification. Students will learn content necessary to pass the National Institute of Metalworking Skills (NIMS) certification test for Measurement, Materials & Safety.

**Prerequisite:** Prerequisite: Completion of CMT 100 with a C or higher or instructor's permission and concurrent enrollment in CMT 102 & CMT 103.

## **CMT 102 Measurement, Materials and Safety 5 Credits**

Provides an overview of basic safety, measurement techniques, and quality assurance processes required for the machining trades. Students will learn content necessary to successfully pass the National Institute of Metalworking Skills (NIMS) certification test for Measurement, Materials & Safety.

**Prerequisite:** Prerequisite: Completion of CMT 100 with C or higher or instructor's permission and concurrent enrollment in CMT 101 & CMT 103.

## **CMT 103 Print Reading for Machine Trades 3 Credits**

Provides knowledge and skills necessary to read and understand blueprints and engineering drawings used in the machine trades.

**Prerequisite:** Prereq for CMT 103

## **CMT 105 Inspection/Quality Control 3 Credits**

Introduces the theory and processes for quality assurance in machining. Students will learn content necessary to pass the National Institute of Metalworking Skills (NIMS) certification test for Job Planning, Benchwork, and Layout. Recommended concurrent enrollment with CMT 106 & CMT 107.

**Prerequisite:** Prerequisite: C or better in CMT 101 and CMT 102 and CMT 103.

## **CMT 106 Fundamental of Machining 5 Credits**

Introduces the basics of machining with a focus on mills/lathes and computer-aided design. Recommended concurrent enrollment with CMT 105 & 107.

**Prerequisite:** Prerequisite: C or better in CMT 101 and CMT 102 and CMT 103.

## **CMT 107 Job Planning, Benchwork, and Layout 5 Credits**

Introduces the tools, machines and theory required for the machining industry, with an emphasis on job planning, benchwork, and layout procedures. Students will learn content necessary to pass the National Institute of Metalworking Skills (NIMS) certification test for Job Planning, Benchwork, and Layout. Recommended concurrent enrollment with CMT 105 & 106.

**Prerequisite:** Prerequisite: C or better in CMT 101 and CMT 102 and CMT 103.

## **CMT 109 CNC Mills and Lathes 6 Credits**

Provides intermediate to advanced instruction on Computer Numerical Controlled (CNC) mills and lathes, with an emphasis on setup and operations, tool mounting, and process planning. Students will learn content necessary to pass the National Institute of Metalworking Skills (NIMS) certification test for CNC Milling - Operations. Recommended concurrent enrollment with CMT 110.

**Prerequisite:** Prerequisite: C or better in CMT 105 and CMT 106 and CMT 107.

## **CMT 110 CNC Programming 6 Credits**

Provides intermediate level instruction in Computer Numerical Controlled (CNC) programming for mills and lathes. Students will learn content necessary to pass the National Institute of Metalworking Skills (NIMS) certification test for CNC Milling - Operations. Recommended concurrent enrollment with CMT 109.

**Prerequisite:** Prerequisite: C or better in CMT 105 and CMT 106 and CMT 107.

## **CMT 130 3D Printing - Additive Manufacturing 5 Credits**

Introduces the process of 3D additive manufacturing as used in low volume production and prototyping within the manufacturing industry.

**Prerequisite:** None.

## **CMT 201 Advanced Machining (Mills and Lathes) 6 Credits**

Provides advanced technical knowledge of manual and computer numerical control (CNC) machining with an emphasis on special cutting processes, analysis of engineering drawings, and quality control. Recommended concurrent enrollment with CMT 202.

**Prerequisite:** Prerequisite: C or better in CMT 109 and CMT 110.

## **CMT 230 Survey of Manufacturing Specializations 6 Credits**

Explores advanced implementation of manufacturing specializations.

**Prerequisite:** Prerequisite: C or better in CMT 109 and CMT 110.

## **CMT 231 Programming Specialization 3 Credits**

Explores CNC Programming in-depth for students interested in specializing in programming in industry.

**Prerequisite:** Prerequisite: C or better in CMT 201.

## **CMT 232 Repair Specialization 3 Credits**

Explores repair and maintenance of machining tools including CNC mills and lathes.

**Prerequisite:** Prerequisite: C or better in CMT 201.

## **CMT 233 Set-Up Specialization 3 Credits**

Explores set-up and operation of CNC mills and lathes used within a production environment in the machining industry.

**Prerequisite:** Prerequisite: C or better in CMT 201.

## **CMT 234 Additive Manufacturing Specialization 3 Credits**

Explores additive manufacturing and 3D printing used within the production environment within the machining industry.

**Prerequisite:** Prerequisite: C or better in CMT 201.

## **CMT 250 Machining Production 7 Credits**

Provides a capstone experience requiring students to design, manage, and machine a final project, utilizing a variety of machining technologies.

**Prerequisite:** Prerequisite: C or better in CMT 201.