Manufacturing Machine Operation Certificates, Levels 1 and 2 (MMOC1, MMOC2)

Manufacturing Machine Operation Level 1 Certificate (MMOC1)

The Manufacturing Machine Operation Level 1 Certificate provides foundation skills needed for entry level employment as a computer numerical control (CNC) machine operator in a manufacturing facility. The certificate also prepares students to take certification exams offered by the National Institute for Metalworking Skills (NIMS).

Students develop skills including manufacturing machine safety, measurement and blueprint reading, materials and product inspection, and statistical process control. Additionally, students perform machining operations such as drilling, tapping, boring, turning, and conventional milling and lathe work using various manual and CNC machine tools.

Manufacturing Machine Operation Level 2 Certificate (MMOC2)

The Manufacturing Machine Operation Level 2 Certificate provides advanced skills training in programming of computerized numerical control (CNC) equipment, using simulators and live operation of a CNC Machining Center and CNC Lathe. This certificate is designed for machine operators, machinists, programmers, engineers, and supervisors.

Students who complete the Level 2 certificate gain understanding of how to use CNC programs to develop parts in compliance with industry plans, specifications, and standards. Additionally, students inspect and evaluate parts and materials to meet design specifications. The certificate also prepares students to take certification exams offered by the National Institute for Metalworking Skills (NIMS).

For more information call the Workforce Development Center at (513) 569-1643 or toll-free (888) 569-1709.

Manufacturing Machine Operation Level 1 Certificate (MMOC1)

Semester 1		Lec	Lab	Credits
MMC 105	Shop Math	1	0	1
MMO 111	Mechanical Plan Reading 1	2	0	2
MMO 120	Mechanical Machining	0	6	3
MMO 125	Introduction to CNC	1	2	2
XXX XXX	Technical Elective	2	0	2
Total Credits:		6	8	10

Technical Elective (minimum 2 credits required)

MMO 110 & MMO 130	OSHA General Industry Safety and Statistical Process Control Fundamentals *	2
MMC 110	MSSC Certified Production Technician Training	6

* Must complete both courses to earn credit for Technical Elective.

Manufacturing Machine Operation Level 2 Certificate (MMOC2)

Semester 1		Lec	Lab	Credits
MMO 112	Mechanical Plan Reading 2	2	0	2
MMO 135	CNC Programming Fundamentals	2	2	3
MMO 136	Computer-Aided Drafting (CAD) for Manufacturing	0	2	1
MMO 137	Computer-Aided Manufacturing (CAM)	0	2	1
MMO 140	CNC Tooling and Maintenance	2	0	2
Total Credits:		6	6	9

Faculty

For more information:

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Courses

MMO 110 OSHA General Industry Safety
1 Credit. 1 Lecture Hour. 0 Lab Hour.
A course for machine operators and first-line supervisors on key OSHA General Industry Safety Standards.
Prerequisites: None

MMO 111 Mechanical Plan Reading 1
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A course on fundamentals of using and interpreting mechanical drawings and blueprints for geometric dimensioning, tolerances, and precision measurement required for manufacturing mechanical parts and assemblies.
Prerequisites: None

MMO 112 Mechanical Plan Reading 2
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A continuation of MMO 111. Topics include: interpretation of software-depicted mechanical drawings, symbols, and renderings for CNC manufacturing of detailed mechanical parts and assemblies.
Prerequisites: MMO 111

MMO 120 Mechanical Machining
3 Credits. 0 Lecture Hour. 6 Lab Hours.
A course on manual machining operations such as drilling, tapping, boring, turning, and conventional milling and lathe work.
Prerequisites: None

MMO 125 Introduction to CNC
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on setup, piece placement, data input, and operation of a computer numeric controlled (CNC) machine.
Prerequisites: None

MMO 130 Statistical Process Control Fundamentals
1 Credit. 1 Lecture Hour. 0 Lab Hour.
A course on statistical process control (SPC) and lean quality processes. Topics include: continuous improvement methods for reducing errors, eliminating defective parts/products, and lowering costs through reduced waste.
Prerequisites: None

MMO 135 CNC Programming Fundamentals
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on using a computer to write CNC machine G and M code. Topics include: using multiple tools; cutter offsets; linear, circular and helical interpolation; and matching surfaces along lines and points of tangency to produce a part.
Prerequisites: MMO 125

MMO 136 Computer-Aided Drafting (CAD) for Manufacturing
1 Credit. 0 Lecture Hour. 2 Lab Hours.
A course on fundamental techniques for using SolidWorks computer-aided drafting (CAD) software. Topics include: standards and conventions of engineering drawings, and generating 3-D solid objects using SolidWorks.
Prerequisites: None

MMO 137 Computer-Aided Manufacturing (CAM)
1 Credit. 0 Lecture Hour. 2 Lab Hours.
A course on fundamental techniques for using Mastercam software to develop a mechanical drawing of a machine component. Topics include: creating geometry and toolpaths; and importing, positioning, and creating toolpaths for solid models using Mastercam.
Prerequisites: None

MMO 140 CNC Tooling and Maintenance
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A course on inspecting and diagnosing CNC machine and tooling parts, making routine adjustments, and taking steps to correct operations and put tooling back in service.
Prerequisites: MMO 125

MMO 150 CNC Modeling and Programming
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on writing a computer program to produce a multi-plane part shown on a blueprint or plan by using a CNC mill and lathe.
Prerequisites: MMO 135

MMO 210 Additive Manufacturing and Machine Operation Fundamentals
3 Credits. 2 Lecture Hours. 2 Lab Hours.
An introduction to additive manufacturing and design of 3D printing parts using parametric CAD software. Topics include: history of additive manufacturing, the production cycle, machine subsystems, measurement practices, and operations safety. Lab activities use additive equipment, software, and materials including polymer filaments in fused deposition modeling.
Prerequisites: MMO 110

MMO 215 Industrial Applications of Additive Manufacturing
4 Credits. 2 Lecture Hours. 4 Lab Hours.
A course on 3D printing processes, materials, and design used in additive manufacturing. Topics include: creating advanced computer-generated drawings using CAD software for materials with lattice structures, and defining manufacturing process parameters. Students take field trips to additive facilities to learn to use industrial equipment for metal 3D printing.
Prerequisites: MMO 210

MMO 220 Applied Project in Additive Manufacturing
2 Credits. 1 Lecture Hour. 3 Lab Hours.
Students work in teams and use knowledge and skills gained in previous Additive Manufacturing (AM) courses to complete a project that produces a finished AM product and documents the production process. Topics include: project management fundamentals, statistical analysis for AM processes, technical writing, and AM design techniques.
Prerequisites: MMO 215