

MANUFACTURING TECHNOLOGY

PREREQUISITES, STANDARDS AND REQUIREMENTS

MANUFACTURING TECHNOLOGY

CNC MACHINING

Certificate of Completion - 44 credits

PROGRAM INFORMATION

The following information applies to all Manufacturing programs. See individual certificate and degree descriptions for specific information.

COST OF PROGRAM

In addition to standard tuition, student fees and textbooks, students should anticipate the following estimated program costs:

- Program fees of \$35-\$135 per class are assessed when taking classes with Amatrol-based content. See online class schedule for class-specific fees. Classes that have Amatrol content include: MFG 101, 110, 115, 133, 211, 213.
- Welding personal protective equipment and tools, approximately \$400.

PROGRAM PREPARATION AND PREREQUISITES

Recommended prior to entry in program (MFG) courses:

- High school diploma or GED
- Minimum placement scores resulting in WR 065 placement or prior completion of WR 060 or higher ("C" or better)
- Minimum placement scores resulting in MTH 020 placement or prior completion of MTH 010 or higher ("C" or better)
- Successful completion of or current enrollment in MATC new-student orientation class MFG 100
- Certificate courses require instructor permission
- Recommended completion of CIS 070 or equivalent skills

MINIMUM GPA OR GRADE REQUIREMENTS

All required courses must be completed at a "C" grade or better and graduates must have an overall 2.0 GPA or higher.

REGISTRATION INFORMATION

Nearly all MATC courses are self-directed, outcome-based curricula. This provides students with a greater degree of flexibility than most other COCC programs. The MATC hours of operation provide students with ample time to complete their coursework during a term.

Upon starting their program, students review their desired certificate or degree outcome with their advisor and a sequence of coursework is identified for them. With the exception of classes in a series (e.g. Manufacturing Processes I, II, III) or those with specific prerequisites (as identified in the catalog) most classes can be taken in any order, provided that instructor permission is obtained.

PROGRAM STANDARDS

Students must maintain a minimum 2.0 GPA each term while enrolled in the program (MFG) courses. Students who do not meet this standard may be dismissed from the program. Students wishing to re-enter the program after being dismissed must gain the prior approval of their MATC advisor.

NATIONAL AND/OR STATE LEGAL ELIGIBILITY REQUIREMENTS FOR LICENSURE OR ENTRY INTO OCCUPATION

Employer requirements vary considerably regarding secondary certifications in Manufacturing. The MATC offers certification preparation classes to assist students in obtaining certifications.

Students desiring specific certifications such as those provided by American Welding Society (AWS) or Society of Manufacturing Engineers (SME) should discuss this with their advisor.

TRANSFER INFORMATION

This certificate is designed for students planning to enter their chosen career upon graduation. Often only selected credits are considered transferrable to public or private baccalaureate institutions. Prior to starting any MATC program, students are advised to contact the institution to which they intend to transfer and identify what credits may be transferrable.

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, CNC Machining

PROGRAM DESCRIPTION

The CNC Machining one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in manufacturing environments using CNC equipment. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

CIS 070 (or higher)	Introduction to Computers: Windows	2
MTH 085 (or higher)	Technical Math I	4
WR 060 (or higher)	Rhetoric and Critical Thinking	4

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 103	Welding Technology I	3
MFG 110	Manufacturing Processes I	3
MFG 112	Manufacturing Processes II	3
MFG 114	Manufacturing Processes III	3
MFG 115	Design Processes I	2
MFG 133	Quality Assurance	3
MFG 202	Metals Preparation	2
MFG 211	CNC Mill Operator	2
MFG 213	CNC Lathe Operator	2
MFG 230	CNC Programming Mill	2
MFG 232	CNC Programming Lathe	2
MFG 234	CAD/CAM Mill	2
MFG 236	CAD/CAM Lathe	2

TOTAL: 44

MANUFACTURING TECHNOLOGY INDUSTRIAL MAINTENANCE

Certificate of Completion - 44 credits

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Industrial Maintenance

PROGRAM DESCRIPTION

The Industrial Maintenance one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in industrial maintenance in a manufacturing environment. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

CIS 070 (or higher)	Introduction to Computers: Windows	2
MTH 085 (or higher)	Technical Math I	4
WR 060 (or higher)	Rhetoric and Critical Thinking I	4

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 102	Blueprint Reading Sheet Metal	2
MFG 103	Welding Technology I	3
MFG 109	Lean Practices	2
MFG 110	Manufacturing Processes I	3
MFG 116	Manufacturing Electrical Systems	2
MFG 118	Fluid Power Systems	2
MFG 160	Materials Engineering	2
MFG 241	Electric Motor Control	2
MFG 242	Programmable Logic Controllers I	2
MFG 243	Industrial Sensors	2
MFG 244	Programmable Logic Controllers II	2
MFG 245	Electrical Controls/Fluid Power	2
MFG 246	Mechanical Troubleshooting	2
MFG 267	Oxygen Fuel and Plasma Cutting	2
MFG 289	Material Handling-Fork Lift Safety	1

TOTAL: 44

MANUFACTURING TECHNOLOGY MANUAL MACHINING

Certificate of Completion - 42 credits

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Manual Machining

PROGRAM DESCRIPTION

The Manual Machining one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in manufacturing environments using manual machining equipment. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

CIS 070 (or higher)	Introduction to Computers: Windows	2
MTH 085 (or higher)	Technical Math I	4
WR 060 (or higher)	Rhetoric and Critical Thinking I	4

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 103	Welding Technology I	3
MFG 110	Manufacturing Processes I	3
MFG 112	Manufacturing Processes II	3
MFG 114	Manufacturing Processes III	3
MFG 115	Design Processes I	2
MFG 133	Quality Assurance	3
MFG 202	Metals Preparation	2
MFG 203	Layout	2
MFG 205	Drill Press	2
MFG 210	Vertical Milling	2
MFG 214	Lathe Operator I	2
MFG 216	Lathe Operator II	2

TOTAL: 42

MANUFACTURING TECHNOLOGY

Certificate of Completion
47 credits

MANUFACTURING TECHNOLOGY QUALITY ASSURANCE

Certificate of Completion - 43 credits

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Manufacturing Technology

PROGRAM DESCRIPTION

The Manufacturing Technology one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in a variety of manufacturing environments. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

BA 285	Business Human Relations	3
or PSY 101	Applied Psychology	
or SP 218	Interpersonal Communication	
CIS 070	Introduction to Computers: Windows	2
(or higher)		
MTH 085	Technical Math I	4
(or higher)		
WR 060	Rhetoric and Critical Thinking I	4
(or higher)		

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 103	Welding Technology I	3
MFG 105	Welding Technology II	3
MFG 107	Welding Technology III	3
MFG 109	Lean Practices	2
MFG 110	Manufacturing Processes I	3
MFG 112	Manufacturing Processes II	3
MFG 114	Manufacturing Processes III	3
MFG 115	Design Processes I	2
MFG 116	Manufacturing Electrical Systems	2
MFG 118	Fluid Power Systems	2
MFG 133	Quality Assurance	3
MFG 160	Materials Engineering	2

TOTAL: 47

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Quality Assurance

PROGRAM DESCRIPTION

The Quality Assurance one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in manufacturing in the quality assurance field. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

CIS 070	Introduction to Computers: Windows	2
(or higher)		
MTH 085	Technical Math I	4
(or higher)		
WR 060	Rhetoric and Critical Thinking I	4
(or higher)		

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 102	Blueprint Reading Sheet Metal	2
MFG 103	Welding Technology I	3
MFG 109	Lean Practices	2
MFG 110	Manufacturing Processes I	3
MFG 112	Manufacturing Processes II	3
MFG 115	Design Processes I	2
MFG 133	Quality Assurance	3
MFG 160	Materials Engineering	2
MFG 202	Metals Preparation	2
MFG 203	Layout	2
MFG 238	Optical Comparator	1
MFG 239	Coordinate Measuring Machine	1
MFG 254	Manufacturing Jigs and Fixtures	2
MFG 262	Welding Inspection/Quality Control	2

TOTAL: 43

MANUFACTURING TECHNOLOGY WELDING

Certificate of Completion - 45 credits

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Welding

PROGRAM DESCRIPTION

The Welding one-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in manufacturing environments using welding equipment. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

All credits required to satisfy the requirements of this one-year certificate can also be applied toward the Associate of Applied Science (AAS) degree in Manufacturing Technology.

PROGRAM REQUIREMENTS

SUPPORT COURSES

MTH 085	Technical Math I	4
(or higher)		
WR 060	Rhetoric and Critical Thinking I	4
(or higher)		

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 103	Welding Technology I	3
MFG 105	Welding Technology II	3
MFG 107	Welding Technology III	3
MFG 110	Manufacturing Processes I	3
MFG 202	Metals Preparation	2
MFG 262	Welding Inspection/Quality Control	2
MFG 267	Oxygen Fuel & Plasma Cutting	2
MFG 271	SMAW I	2
MFG 272	GMAW I	2
MFG 273	SMAW II	2
MFG 274	GMAW II	2
MFG 281	GTAW I	2
MFG 282	FCAW I	2
MFG 283	GTAW II	2
MFG 284	FCAW II	2

TOTAL: 45



MANUFACTURING TECHNOLOGY

Two-Year Certificate of Completion

85 credits

CERTIFICATE AS AWARDED ON TRANSCRIPT

Certificate of Completion, Manufacturing Technology II

PROGRAM DESCRIPTION

The Manufacturing Technology two-year certificate of completion program is a self-directed, outcome-based program designed to prepare students for technician-level employment in a variety of manufacturing environments. The program is offered exclusively at the Manufacturing and Applied Technology Center (MATC) at COCC's Redmond Campus. Department approval is required for enrollment at the Manufacturing and Applied Technology Center.

PROGRAM REQUIREMENTS**SUPPORT COURSES**

BA 285	Business Human Relations	3
or PSY 101	Applied Psychology	
or SP 218	Interpersonal Communication	
CIS 070	Introduction to Computers: Windows	2
(or higher)		
MTH 085	Technical Math I	4
(or higher)		
WR 060	Rhetoric and Critical Thinking I	4
(or higher)		

CORE REQUIREMENTS

MFG 100	MATC Orientation	1
MFG 101	Blueprint Reading	2
MFG 103	Welding Technology I	3
MFG 105	Welding Technology II	3
MFG 107	Welding Technology III	3
MFG 109	Lean Practices	2
MFG 110	Manufacturing Processes I	3
MFG 112	Manufacturing Processes II	3
MFG 114	Manufacturing Processes III	3
MFG 115	Design Processes I	2
MFG 116	Manufacturing Electrical Systems	2
MFG 118	Fluid Power Systems	2
MFG 133	Quality Assurance	3
MFG 160	Materials Engineering	2

MANUFACTURING ELECTIVES

Students must choose at least 38 credits from the following program electives:

CIS 135S1	Solidworks 1	4
MFG 102	Blueprint Reading Sheet Metal	2
MFG 201	Benchwork	2
MFG 202	Metals Preparation	2
MFG 203	Layout	2
MFG 205	Drill Press	2
MFG 210	Vertical Milling	2
MFG 211	CNC Mill Operator	2
MFG 213	CNC Lathe Operator	2
MFG 214	Lathe Operator I	2
MFG 216	Lathe Operator II	2
MFG 230	CNC Programming Mill	2
MFG 232	CNC Programming Lathe	2
MFG 234	CAD/CAM Mill	2
MFG 236	CAD/CAM Lathe	2
MFG 238	Optical Comparator	1
MFG 239	Coordinate Measuring Machine	1
MFG 241	Electric Motor Control	2
MFG 242	Programmable Logic Controllers I	2
MFG 243	Industrial Sensors	2
MFG 244	Programmable Logic Controllers II	2
MFG 245	Electrical Controls/Fluid Power	2

MFG 246	Mechanical Troubleshooting	2
MFG 250	Additive Manufacturing	2
MFG 254	Manufacturing Jigs and Fixtures	2
MFG 262	Welding Inspection/Quality Control	2
MFG 264	Automated Welding/Cutting	2
MFG 266	Manufacturing Cost Estimating	2
MFG 267	Oxygen Fuel and Plasma Cutting	2
MFG 271	SMAW I	2
MFG 272	GMAW I	2
MFG 273	SMAW II	2
MFG 274	GMAW II	2
MFG 275	SMAW III	2
MFG 276	GMAW III	2
MFG 281	GTAW I	2
MFG 282	FCAW I	2
MFG 283	GTAW II	2
MFG 284	FCAW II	2
MFG 285	GTAW III	2
MFG 286	FCAW II	2
MFG 287	CNC Press Brake/Shearing	3
MFG 288	Industrial Fabrication	3
MFG 289	Material Handling–Fork Lift Safety	1
MFG 290	Certification Test Prep AWS I	1
MFG 291	Certification Test Prep NIMS I	1
MFG 292	Certification Test Prep AWS II	1
MFG 293	Certification Test Prep NIMS II	1
MFG 294	Certification Test Prep AWS III	1
MFG 295	Certification Test Prep NIMS III	1
MFG 296	Certification Test Prep SME	1
MFG 297	Certification Test Prep NAIT	1

TOTAL: 85 CREDITS