Machinist/ Machinist Apprentice

The *Machinist Apprentice* curriculum provides apprentices with the study materials that enables them to perform the tasks associated with this trade. It is appropriate for trainees who need a complete understanding of the machine shop.

The program has been designed to meet the subject requirements set forth in the standards established by the Bureau of Apprenticeship and Training (BAT). When combined with on-the-job training, this program will provide trainees with the comprehensive skills and knowledge they will need to perform in this trade area.

Upon completion of this program, students will be able to:

- Read a shop drawing.
- Select the proper metal alloy.
- Work with basic mathematics, algebra, geometry, and trigonometry.
- Calculate the proper speeds and feeds for different materials.
- Describe the sequence of operations to complete a job.
- Discuss the hardening and tempering of steel.
- Describe the setup and operation of standard machine tools such as the lathe, grinder, milling machine, and drill press; also broaches, boring mills, and planers.
- Select the proper speeds and feeds for cutting metal.
- Explain the various shapes of cutting tools.
- Discuss the setup and operation of numerically controlled machine tools.

Base Curriculum

Course Title	Course Number
Pre-Technical and Basic Industrial Skills	
Trades Safety: Getting Started	186001
Working Safely with Chemicals	186002
Fire Safety	186003
Material Handling Safety	186006
Basic Industrial Math	Block X21
Addition and Subtraction	186008
Multiplication and Division	186009
Fractions, Percents, Proportions, and Angles	186010
Metric System	186011
Formulas	186012
Introduction to Algebra	186013
Linear and Distance Measurement	186021
Problem Solving and Troubleshooting	186073
Applied Geometry	186085
Practical Trigonometry	186086
Introduction to Print Reading	186080
Print Reading Symbols and Abbreviations	186081
Dimensioning and Tolerancing	186082
Reading Shop Prints, Part 1	386043
Reading Shop Prints, Part 2	386044
Geometric Dimensioning and Tolerancing	386E01
Bench Work	5004A-C
Precision Measuring Instruments, Part 1	186068
Precision Measuring Instruments, Part 2	186069
Precision Measuring Instruments, Part 3	186072
Jobs, Companies, and the Economy: Basic Concepts for Employees	186034
Quality Concepts: Tools and Applications	186036
Machining, Metal Working, and NC/CNC	
Fundamentals of Metal Cutting	386030
Machine Shop Safety	186007
Metal Processing	186087
Ferrous Metals	186088
Nonferrous Metals	186089
Identification of Metals	186090
Layout	3501
Drilling Part 1	386050
Drilling Part 2	386051
Lubrication, Part 1	286091
Lubrication, Part 2	286092
Fasteners	286095
Milling Machine Fundamentals	386031
Milling Machine Cutting Tools	386032
Milling Machine Practice and Operation, Part 1	386033
Milling Machine Practice and Operation, Part 2	386034
Milling Machine Indexing and Spiral Work	386035
Lathes, Part 1	386036
Lathes, Part 2	386037
Lathes, Part 3	386038
Lathes, Part 4	386039
Lathes, Part 5	386040
Automatic Screw Machines	3530A-B
Turret Lathes	3525A
Turret Lathe Tools and Setups	2213
Fundamentals of Grinding	386016
Cylindrical Grinding, Part 1	386010
Cylindrical Grinding, Part 2	386011
Surface Grinding, Part 1	386012
Surface Grinding, Part 2	386013
Inspection of Shop Products	5962
Quality Control for the Technician	386E02
Boring Mills	5636A
Planers	6118
Broaching	6091
Shapers, Slotters, and Keyseaters	2222
Nontraditional Machining Technologies	386029
Hardening and Tempering	3195
Tool Grinding	386017
Tool Dressing	3194
Gear Calculations	2243
Gear Making	5532A-B
Manufacturing Processes, Part 1	186075
Manufacturing Processes, Part 2	186076
Manufacturing Processes, Part 3	186077
Manufacturing Processes, Part 4	186078

CNC Technology and Programming 066903
CNC Turning.....386041
CNC Milling 386042
Toolholding Systems 386028

Estimated Curriculum Duration: 783 hours.
Number of Exams: 89.

Optional: Tool and Die Maker Skills

Mechanics of Materials 5282A-C
Heat Treatment 3541A-D
Dies and Die Making.....5101A-B
Dies and Die Making, Part 3 386048
Forging Dies.....3199
Making Forging Dies 3197
Toolmaking 2540A-C
Toolmaking, Part 4 386047
Gage Making 5098
Jigs and Fixtures 5099
Jig and Fixture Making.....5100
Jig and Fixture Making, Part 2.....386049

Estimated Duration: 200 hours.
Number of Exams: 20.