Basic Machining Class Syllabus

Cost: $375

Course Length: 36 hours (6 weeks)

Instructor: Fred Nickel

The purpose of this class is to educate and inform the home hobbyist and persons interested in machining and its application.

Thank you for your interest in the Mifflin County Academy of Science & Technology's adult education program. Please note that there are some requirements that need to be addressed. First, hard sole shoes with leather uppers should be worn, sneakers will not be allowed due to sharp turnings and chips. Clothing is also a concern, pants with frays or holes should be avoided and please no long sleeve shirts. These personal safety issues are important; due to moving machinery.

Safety equipment such as safety glasses will be provided for your use. Please feel free to bring your own equipment (Safety Glasses must be OSHA rated Z87+) if you have it and wish to use it.

This course will run for a total of thirty-six (36) hours. Classes are typically held two evenings a week from 6-9 PM – subject to change due to instructor schedule, weather or holidays.

Class schedule.

Class # 1 – Introduction to Machining

- Machine shop safety
- Types of Machines
- Shop Orientation
- Introduction to Machining operations
- Machine Safety: (This will be just a highlighted version, more in-depth discussion and demonstration will be presented at each Specific Machine)

Class #2 – Types of Cut-off Machines and Safety Procedures

- Up-right Band Saw
- Contour Band Saw
- Abrasive Cut-off Saw

Class #3 – Drill Presses, pedestal Grinders and Safety Procedures

- Sensitive Drill Press
- Radial Arm Drill Press
- Speeds and Feeds for Drilling
- Cutting Fluid

- Hand Sharpening Drill Bits
- Correct Use of Center punches and Center Drills

Class #4 – Lathe and Safety Procedures

- Introduction to the lathe
- Identifying the parts and controls of a lathe
- Facing, Turning, drilling and Knurling
- Speeds and Feeds for Drilling, and Turning
- Sharpening lathe tools

Class #5 - Lathe and Safety Procedures

- Introduction to Boring
- Introduction to Threading: Right and Left hand
- Discussions on Multi-lead, Acme, Square and other types of threads

Class #6 – Vertical Milling Machine and Safety Procedures

- Introduction to the Vertical Milling Machine
- Identifying the parts and controls of a Vertical Milling Machine
- Squaring the Head and Aligning a Vise
- Climb Milling or Conventional Milling (Which Way Should I Go)
- Choosing the correct Cutter for the Job
- Speeds and Feeds for Milling

Class #7 – Horizontal Milling Machine and Safety Procedures

- Introduction to the Horizontal Milling Machine
- Identifying the parts and controls of a Horizontal Milling Machine
- Aligning a Vise
- Climb Milling or Conventional Milling (Which Way Should I Go)
- Choosing the correct Cutter for the Job
- Speeds and Feeds for Milling

Class #8 – Surface and Cylindrical Grinding Machine and Safety Procedures

- Introduction to the Grinding Machine
- Identifying the parts and controls of a Grinding Machine
- Types of Grinding wheels

Class #9 – Student Project – C-Clamp or Center Punch

- Material selection
- Lay- Out
- Band Saw Operations

Class #10 – Student Project – C-Clamp - or Center Punch

- Milling Machine Operations

Class #11 - Student Project – C-Clamp

- Lathe Operations

Class #12 – Student Project

- Wrap Up Projects
- Question and Answers

This agenda is subject to change depending on class advancement. There are hundreds if not thousands of machining procedures and operations in the field of machining. There is no possible way to cover all facets of this ever growing field in the basic machining class. To reiterate; the purpose of this class is to educate and inform the home hobbyist and persons interested in machining and its application, not to prepare a person for an entry level manufacturing position.

Again thank you for your interest and support.