



Master Course Syllabus

MAC 1020: Introduction to Milling Machine

Purpose of Document

This document contains important information about this course's objectives. It may be helpful for you to retain a copy for your records, along with the class specific syllabus. This document will be especially helpful if you decide to later change your course of study.

Pikes Peak State College and the Colorado Department of Higher Education have determined that graduates should have a broad range of learning skills as well as discipline related skills. Both types of skills are detailed below.

Course Description

Teaches students to identify the major parts of the vertical mill, align a vise, use an indicator, edge finder, and boring head, determine speeds and feeds perform simple indexing, mill flat, square surfaces and slots, drill, bore, and tap holes, and work within a plus or minus .002 inch tolerance.

Credit Hours: 3

Contact Hours: 67.5 (Lecture/Lab Combination)

Required Course Learning Outcomes

- I. Recognize and locate the controls
- II. Recognize the necessity of personal safety gear
- III. Recognize the necessity of securely clamping work
- IV. Explain the necessity of keeping hands and fingers clear of rotating cutter
- V. Recognize danger of automatic feeds
- VI. Name the principal parts of the vertical mill
 - A. Tool head
 - B. Ram
 - C. Column
 - D. Table
 - E. Saddle
 - F. Knee
 - G. Pedestal
 - H. Base
- VII. Discuss the function of each of the above parts
- VIII. Demonstrate using a square and indicator to align a vise or clamped workpiece.
- IX. Demonstrate the use of an edge finder.
- X. Define speed and feed terminology.
- XI. Discuss the determining factors when adjusting feeds and speeds.
 - A. Work material and condition

- B. Cutter material and type
- C. Coolant (or lack thereof)
- D. Depth of cut
- E. Finish required
- F. Width of cut
- XII. Differentiate between and demonstrate
 - A. Face milling
 - B. Side milling
 - C. Slitting
 - D. End milling
 - E. Slotting
- XIII. Demonstrate using the vertical mill for:
 - A. Drilling
 - B. Tapping
 - C. Boring
- XIV. Demonstrate the method for applying the indexing head
- XV. Explain how the indexing head is applied to drilling, tapping, and boring

Required Topical Outline

- I. Safety: Safety in Using the Vertical Milling Machine.
- II. Parts of the Vertical Milling Machine: Identify the Parts of the Vertical Milling Machine.
- III. Setting Up Work: using a Vise or Clamps to Set Up Work.
- IV. Speeds and Feeds: Determining Speeds and Feeds for the Vertical Milling Machine.
- V. Type of milling: The Types of Milling Done on the Vertical Mill.
- VI. Indexing Head: Use of the Indexing Head for Hole Locations.