**CHAMP Course Map**

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| **Course Name:** MAC 120 Introduction to Milling Machine | |
| **Instructor Name:** | **Date:** |
| Course Competencies:  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. | |
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**Course Materials (Text, Edition and any other publisher items)**

**Textbooks and/or Resources:** Precision Machining Technology 2nd Edition, Peter J. Hoffman Eric S. Hopewell Brian Janes, ISBN-13: 9781285444543

**Resources:**

| **Module # and Title** | **CCNS Competencies** | **Content, Activities or Challenges**  **(Learner Interaction**  **& Engagement)** | **Assessments, Rubrics (Feedback)** | **Publish to OER** |
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| Module 1:  Syllabus and Introduction to Milling Machine | I.  VI.  VII. | 1. Discuss Syllabus and Outline  2. Reading assignments on Module 1 Introduction to Milling Machine:   * Introduction to Milling Machine   3. Discuss Module 1 Chapters within the Machine Shop Environment  4. Complete Module 1 Vocabulary | 1. Module 1 Verbal Feedback to Lab Lectures 2. Complete Module 1 Vocabulary   3. Module 1 Nomenclature Quiz  4. MAC Rubric | * Syllabus and Outline * Module 1 Lecture Notes (IMM) * Module 1 Vocabulary * MAC Grading Rubric |
| Module 2:  Safety | II.  III.  IV.  V. | 1. Reading assignments on Module 2 Safety:   * General milling machine safety   2. Discuss Module 2 Chapters within the Machine Shop Environment  3. Complete Module 2 Vocabulary | 1. Module 2 Safety Quiz General  2. Module 2 Safety Quiz Symbols  3. Complete Module 2 Vocabulary | * Module 2 Lecture notes (MSS) * Module 2 Vocabulary |
| Module 3:  Tramming, Indicating  and Edge Finding | VIII.  IX. | 1. Reading assignments on Module 3 Tramming, Indicating  and Edge Finding:   * Tramming the vertical milling machine head * Aligning Workholding devices * Locating from an edge * Locating the center of an existing part feature   2. Discuss Module 3 Chapters within the Machine Shop Environment  3. Complete Module 3 Vocabulary | 1. Module 3 Verbal Feedback to Lab Lectures  2. Complete Module 3 Vocabulary | * Module 3 Lecture notes (TIEF) * Module 3 Vocabulary |
| Module 4:  Speeds and Feeds | X.  XI. | 1. Reading assignments on Module 4 Speeds and Feeds:   * Speeds and feeds for milling operations   2. Discuss Module 4 Chapters within the Machine Shop Environment  3. Complete Module 4 Vocabulary | 1. Module 4 Verbal Feedback to Lab Lectures  2. Complete Module 4 Vocabulary | * Module 4 Lecture notes (SF) * Module 4 Vocabulary |
| Module 5:  Milling Machine Operations | XII.  XIII. | 1. Reading assignments on Module 5 Milling Machine Operations:   * Milling basics * Angular milling * Milling steps, slots and keysets * Slotting with slitting saws * Milling radii   2. Discuss Module 5 Chapters within the Machine Shop Environment  3. Complete Module 5 Vocabulary  4. Watch Videos on Milling Machine Operations | 1. Module 5 Verbal Feedback to Lab Lectures  2. Complete Module 5 Vocabulary  3. Complete Module 5 Course Assignments | * Module 5 Lecture notes (MMO) * Module 5 Vocabulary |
| Module 6:  Indexing Head and Indexing Operations | XIV.  XV. | 1. Reading assignments on Module 6 Indexing Head and Indexing Operations   * The indexing head * Indexing head setup * Indexing head operations   2. Discuss Module 6 Chapters within the Machine Shop Environment  3. Complete Module 6 Vocabulary | 1. Module 6 Verbal Feedback to Lab Lectures  2. Complete Module 6 Vocabulary | * Module 6 Lecture notes (IH) * Module 6 Vocabulary |