**Elgin Community College**

**Course Outline**

**IMT 0104 Industrial Manufacturing Tech. II**

**Contact Info:**

**Chris Sikora**

**847-214-7049**

**Prerequisite: IMT 103 or consent of instructor**

**Description:**

**This course is a continuation of IMT 103 beginning with engine lathes and introducing horizontal mills, vertical mills, and CNC basics. Course includes related information on tooling, speeds and feeds, measuring instruments and manufacturing theory. 3 Credit Hours**

**Books, Supplies, and Supplementary Materials Required**

**\*\* "Machine Tool Practices," Kibbe, 8th ed., Prentice Hall**

**Course Outline**

**A. Milling Machines, Accessories, and Operations**

 **1. Types**

 **2. Classification - size**

 **3. Milling machine constructin features and function**

 **4. Milling machine accessories and attachments**

 **5. Millnig cutters**

 **a. Cutter materials**

 **b. Milling cutter goemetry**

 **c. Milling cutter nomenclature**

 **d. Types of milling cutters**

 **6. Milling machine operation**

 **a. Milling machine safety**

 **b. Machine alignment**

 **c. Mounting of the work**

 **d. Direction of feed**

 **e. Backlash compensation**

 **f. Cutter selection**

 **g. Cutting speeds, feed, depth of cut**

 **h. Cutting fluids**

 **i. Primary cutting operations**

 **j. Indexing**

 **k. Helical milling**

 **l. Gear cutting**

**B. Introduction to Computer Numerical Control**

 **1. How the CNC systems operate**

 **2. Types of CNC**

 **3. Program format examples**

 **4. Completed program operation**

**Course Content Outcomes**

**Safely set up and perform basic milling operation with selected mills, tools, cutters, and accessories.**

**Safely set up and perform basic lathe operations.**

**Be acquainted with computer numerical control processes, equipment, and employment opportunities.**

**General Education learning outcomes**

**Speaking Outcomes**

**Students will demonstrate oral presentation skills by being able to: Compose a presentation that has appropriate content. Organize and connect major ideas. Express ideas using clear, effective and appropriate language. Speak in a clear and coherent manner. Use effective nonverbal skills. Include effective supporting materials.**

**Quantitative Literacy Outcomes:**

**Students will demonstrate the ability to understand the language of mathematics and its real world applications by being able to:**

**• perform symbolic manipulation, solve equations and systems of equations, and plot the graphs of functions; and**

**• model real world application problems through identifying appropriate data, defining variables, and setting up equations and systems of equations.**

**Critical Thinking Outcomes**

**Students will demonstrate critical thinking skills by being able to:**

**• interpret and analyze information by categorizing, clarifying meaning in context, identifying ideas, detecting arguments and analyzing arguments into component elements;**

**• evaluate ideas by assessing claims and arguments and justifying procedures;**

**• draw inferences by questioning evidence, selecting alternatives, and drawing conclusions; and**

**• demonstrate inductive and deductive reasoning skills.**

**Measures of Student Performance**

**Students are expected to attend all classes. Students missing class sessions are responsible for work assigned during their absence. Excessive absences may warrant reduction of grade as appropriate.**

**Grades will be based on a combination of student performance within specified areas. Performance areas include texts and related material, machining exercises, and shop techniques. Quiz, Final Exam, Task Sheets, Lab Projects, Attendance, Shop Performance**

This course meets the agreed upon terminal objectives for the Computer Numerical Control Operator Program.

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