**Elgin Community College**

**Course Outline**

**IMT 0103 Industrial Manufacturing Tech. I**

**Contact Info:**

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**Prerequisite: None**

**Description:**

**This course provides classroom and laboratory learning experiences related to fundamental machine tool technology by focusing on power saws, drill presses, basic lathes and related tooling. Course includes speed and feed calculation, part layout, basic measuring tools and related manufacturing theory. Safe work practices are strongly stressed. 3 Credit Hours**

**Textbook Required**

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

**Course Outline**

**A. Orientation to Machine Tool Industry**

 **1. Basis of the industry**

 **2. Machine tools defined**

 **3. Machine tool occupations**

 **4. Training for advanced technology**

**B. Measuring Tools**

 **1. Semi-precision measuring tools**

 **a. Steel rule and its equivalents**

 **b. Combination set**

 **c. Depth gauges**

 **d. Calipers**

 **2. Precision measure tools**

 **a. Decimals and decimal equivalents**

 **b. Allowances and tolerances**

 **c. Metric measurements**

 **d. Micrometers**

 **e. Vernier instruments**

 **f. Dial indicators**

 **g. Gauges - types and uses**

 **h. Gauge blocks**

**C. Bench Tools**

 **1. Hand tools and vices**

 **2. Cutting tools**

 **3. Hand threading tools**

**D. Layout Tools and Layout**

 **1. Use of blueprints**

 **2. Coating materials**

 **3. Surface plates**

 **4. Layout tools - types and uses**

 **5. Layout procedures**

**E. Power Saws - Types and Uses**

 **1. Band machines**

 **2. The saw band**

 **3. Vertical and machining operations**

 **4. Power hacksaw**

 **5. Circular saws - cold sawing**

 **6. Abrasive cut-off machines**

**F. Drilling Machines, Accessories, and Operations**

 **1. Types of drilling machines**

 **2. Construction features and size classification**

 **3. Cutting tools for drilling machines**

 **4. Cutting tool holding devices**

 **5. Work holding devices**

 **6. Drill press operations and setups**

 **7. Drill press maintenance**

**G. Engine Lathes, Accessories, and Operations**

 **1. Types**

 **2. Classification - size**

 **3. Lathe construction features and function**

 **4. Lathe accessories and attachments**

 **a. Work holding devices**

 **b. Work supporting devices**

 **c. Tool posts and tool hardware**

 **d. Taper attachment**

 **5. Cutting tools**

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

 **7. Cutting fluids**

 **8. Lathe operations**

 **9. Lathe maintenance**

**H. Production Turning**

 **1. Turret lathes**

 **a. Types of construction**

 **b. Cutting tools and machining operations**

 **2. Automatic lathes and screw machines**

**Course Content Outcomes**

**Be acquainted with the machine tool industry, its basis, definition, career opportunities, and training requirements.**

**Be able to identify, select, and properly use basic semi-precision and precision measuring tools.**

**Be able to identify and demonstrate proper and safe use of related hand tools.**

**Be able to use proper layout methods and tools to construct a layout.**

**Be able to select, set up, and safely operate metal cutting power saws.**

**Be able to identify and select the proper drilling machines and be able to set up and perform basic operation with drilling machines and accessories.**

**Be able to set up and perform basic operations with selected lathes, tools, and accessories.**

**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, and shop performance.**

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

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