South Central College

MTT 1210  Concept Engineering I

Course Outcome Summary

Course Information

Description  In this course, students will continue developing their understanding of machining and use of tools. Their skills are more fully developed in terms of lathe, milling, grinding and drill press. Hands-on experience and practical application opportunities allow students to increase proficiency with machine tools.  
(Prerequisites: MTT 1130 and MTT 1140)

| Total Credits | 4 |
| Total Hours   | 96 |

Types of Instruction

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Pre/Corequisites

MTT 1130 and MTT 1140

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. **Exhibit safe practices in the shop**
   
   Learning Objectives
   
   Demonstrate use of Personal Protective Equipment (PPE)
   
   Adapt PPE as needed
   
   Explain OSHA guidelines and apply to shop situations

2. **Explain a variety of symbols and notations used on machining prints**

   Learning Objectives
Identify different nomenclature of engineering drawings
Differentiate between symbols and notations and their meaning

3. **Interpret usage of tolerances**
   Learning Objectives
   Compare bilateral and unilateral tolerances
   Identify limit tolerances
   Formulate appropriate application of Maximum Material Condition (MMC)

4. **Use planning methods that ensure quality**
   Learning Objectives
   Calculate average and standard deviation
   Utilize sampling and inspection plans to check quality

5. **Explain major machine tools**
   Learning Objectives
   Discuss the different uses for machines
   Differentiate hand tools
   Identify proper use for lathe, mill, drills and tooling

6. **Demonstrate precision layout**
   Learning Objectives
   Use height gage as needed
   Demonstrate the use of the precision angular and vernier bevel protractor
   Use sine tools

7. **Demonstrate clamping and workholding skills**
   Learning Objectives
   Differentiate between C-clamp, parallel clamp and hinged clamp
   Select appropriate clamp or workholding for a given task
   Use clamps and workholding fixtures

8. **Identify pedestal grinder parts**
   Learning Objectives
   Label basic components of the pedestal grinder
   Identify major safety components of the pedestal grinder

9. **Identify surface grinder parts**
    Learning Objectives
    Label basic components of the surface grinder
    Identify safety features and guards on the surface grinder

10. **Demonstrate dressing grinding wheels properly**
    Learning Objectives
    Use diamond to dress surface grinder wheels
    Use dresser to dress pedestal grinder wheels

11. **Demonstrate tool grinding**
    Learning Objectives
    Grind drill bits
    Grind high speed steel lathe tools

12. **Apply engineering drawing specifics to projects**
    Learning Objectives
    Utilize information to determine steps of projects
    Develop a plan based on print components
    Consult drawing to create parts
SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

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