



South Central College

MTT 1130 Job Planning, Benchwork and Layout Level I

Course Outcome Summary

Course Information

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| Description | This course provides an exploration of the basics of hand tools, understanding drawings, manual machines and layout. Upon completion of this course the student will be able to interpret drawing information, describe basic symbols and notation and interpret basic Geometric Dimensioning and Tolerancing (GD&T) feature control frames. Teamwork, critical thinking and problem solving are emphasized. Hands-on experience and practical applications are included. (Prerequisites: Declare MTT as a major) |
| Total Credits | 3 |
| Total Hours | 80 |

Types of Instruction

| Instruction Type | Credits/Hours |
|------------------|---------------|
| Lec | 1/16 |
| Lab | 2/64 |

Pre/Corequisites

Declare MTT as a major.

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. Access Drawings

Learning Objectives

- Explain Key Terms
- Utilize the Components of Engineering Drawings
- Create Title Block
- Describe Line Types

2. Identify Basic Symbols and Notation

Learning Objectives

Explain Fillet
Interpret Rounds and Counterbore
Identify Drawing Nomenclature
Use Symbols and Notation

3. Determine Tolerances

Learning Objectives

Explain Bilateral Tolerances
Explain Unilateral Tolerances
Acknowledge Limit Tolerances
Apply Maximum Material Condition (MMC)
Apply Tolerance Specifications

4. Explain Types of Machines

Learning Objectives

Adapt safety practices with Machines
Demonstrate Basic Machine Maintenance
Identify Tool and Blade Materials
Develop an Understanding of Tool and Blade Characteristics

5. Apply Classes of Fit

Learning Objectives

Define Classes of Fit
Demonstrate Allowances Between Parts
Describe Classifications of Fits
Use Machinery Handbook

6. Define Geometric Dimensioning and Tolerancing (GD&T)

Learning Objectives

Explain GD&T
Use Drawing to Define Datum
Demonstrate the Use of a Feature Control Frame
Identify Flatness, Circularity and Cylindricity
Define Profile and Location Tolerances
Apply Runout Tolerances
Describe Modifiers

7. Apply Layout Fundamentals

Learning Objectives

Explain Key Layout Terms
Use Layout Fluid
Demonstrate Dye Remover Technique

8. Demonstrate Semi-Precision Layout

Learning Objectives

Explain Semi-Precision Layout
Use Scriber
Demonstrate Layout with a Combination Set
Demonstrate Angle Layout with a Combination Set
Use Center Punches and Other Hand Tools

9. Demonstrate Precision Layout

Learning Objectives

Use Height Gage
Demonstrate the Use of the Precision Angular

Demonstrate the Use of the Vernier Bevel Protractor
Use Sine Tools

10. Apply Proper Hand Tool Use

Learning Objectives

Identify Shop Tools
Demonstrate Proper Tool Use
Demonstrate Safe Shop Practices

11. Demonstrate Clamping Methods

Learning Objectives

Explain the Different Clamping Methods
Use C-Clamp
Use Parallel Clamp
Use Hinged Clamp

12. Exhibit Deburring Skills

Learning Objectives

Explain File Classifications
Define the Basic Parts of a File
Select Proper File for Job
Demonstrate File Cleaning

13. Use Abrasives

Learning Objectives

Explain Abrasives
Choose Abrasive Material
Demonstrate Deburring

14. Apply Knowledge to Saws and Cutoff Machines

Learning Objectives

Adapt Quality Terms
Compare Inspection and Preventative Processes
Calculate Speed and Feed
Develop Sampling Plan
Create Inspection Plan
Define Statistical Process Control (SPC)

15. Develop Workholding Skills

Learning Objectives

Explain Ferrous Metals
Explain Nonferrous Metals
Define Tempering
Describe Heat Treatment Process
Characterize Hardness Scales and Testing

16. Use Drill Press

Learning Objectives

Demonstrate Drilling Operations
Apply Countersinking, Spotfacing and Counterboring Practices
Identify Various Tap Types and Tap Drill Selection
Demonstrate Tap Removal Techniques

17. Maintain Speeds and Feeds

Learning Objectives

Perform Speed and Feed Operations
Demonstrate Lubrication
Use Cutting Fluids

Demonstrate Measuring of Cutting Fluid Techniques
Explain Methods of Application

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

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.