South Central College

MECA 1223 Mechanical Systems 1

Course Outcome Summary

Course Information

Description This course includes an introduction to mechanical drawings, Geometric Dimensioning & Tolerancing and simple machines. The student will study the application and kinematic motion of simple machines elements. In addition, lab work will emphasize the safe use of hand tools, portable power tools and mechanical measuring tools and instruments. Troubleshooting of mechanical systems will be emphasized. Technical writing skills and safety procedures will be implemented throughout the course.

Total Credits 3

Total Hours 64

Types of Instruction

Instruction Type	Credits/Hours
Lecture	2/32
Lab	1/32

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 an ability to interpret mechanical prints.

Learning Objectives

Examine engineering prints.
Demonstrate an understanding of lines and views used in mechanical prints.
Draw engineering prints using common drawing standard views.
Identify major components of a drawing.
Demonstrate proper usage of drawing annotation such as dimensions, tolerances, surface texture, and feature callouts.

2. Interpret prints that use Geometric Dimensioning and Tolerancing.

Learning Objectives

Identify symbols used in GD&T.
Explain material conditions as related to GD&T.
Show awareness and understanding of modifiers.
Demonstrate ability to properly interpret geometric tolerances.
Identify datums used in detail part prints.
Demonstrate ability to properly interpret orientation controls.
Demonstrate ability to properly interpret concentricity and symmetry controls.
Demonstrate ability to properly interpret runout and profile controls.

3. Show an understanding of the benefits of Geometric Dimensioning and Tolerancing.

Learning Objectives

Obtain knowledge of GD&T rules.
Explain the shortcomings of coordinate tolerancing.
Identify the differences between GD&T and coordinate tolerancing.

4. Review physical properties of force, motion, work, energy and power.

Learning Objectives

Describe the sources of and means of measuring force.
Describe types of motion and Newton's Laws of Motion.
Define work and the various forms of energy.
Define power and the common formulas for calculating power.

5. Describe simple machines and their use in complex machines.

Learning Objectives

Classify the six classical simple machines.
Compute mechanical advantage of each of the simple machines.
Explain and calculate mechanical efficiencies of simple machines.

6. Explain the types of components that make up machine elements.

Learning Objectives

Summarize key components of complex machines.
Describe linear and rotary machine motions.
Identify the four main types of mechanisms.
Characterize the motions of common lever linkages.

7. Obtain an understanding of measurement tools and instrumentation used in mechanical systems.

Learning Objectives

Describe measurement parameters used in machines.
Identify typical portable instruments used in the maintenance and development of machines.
Demonstrate ability to safely and properly use portable instruments used with mechanical equipment and machines.

8. Demonstrate safe and proper use of hand tools.

Learning Objectives

Identify common mechanical hand tools.
Demonstrate safe and proper use of common mechanical hand tools.
Review benefits of maintaining and organizing hand tools.

9. Demonstrate the safe and proper use of portable power tools.

Learning Objectives

Identify common portable power tools.
Explain general safety guidelines for power tools.
Demonstrate safe and proper use of portable power tools.

10. Explain the use and key characteristics of fasteners.

Learning Objectives

List the various types of fasteners used in common machines.
Identify common screw thread forms and thread specifications.
Describe safety wiring as a method to secure fateners and other equipment.

11. Describe friction and wear as applied to mechanical components.

Learning Objectives

Describe the nature and causes of friction.
Characterize static and dynamic friction.
Perform measurements of friction.
Explain the major consequence of friction - wear.

SCC Accessibility Statement

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

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