
**Southwest Center for Microsystems Education (SCME)
University of New Mexico**

Introduction to Actuators Learning Module

This booklet contains four units:

Pre-test (Knowledge Probe)

Introduction to Actuators Primary Knowledge (PK) unit

Activity – What are Actuators?

Final Assessment

This learning module is one of three SCME modules that discuss the types of components found in microelectromechanical systems (MEMS). This module covers “actuators” – what they are, how they work and how they are used in both macro and micro-sized systems. An activity provides further exploration into specific actuators and how they are used in everyday devices. Two related learning modules cover MEMS transducers and sensors.

Target audiences: High School, Community College, University

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Website: www.scme-nm.org

Introduction to Actuators

Knowledge Probe

Participant Guide

Introduction

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The purpose of this assessment is to determine your current understanding of actuators.

1. The output of an actuator is
 - a. current
 - b. motion
 - c. heat
 - d. variable

2. Which of the following BEST describes an actuator? A device that
 - a. quantifies a value on its input and produces a readable output.
 - b. produces a readable output representative of a change.
 - c. converts one form of energy to another form of energy.
 - d. converts a change on the input into a proportional movement.

3. Which of the following is a mechanical actuator?
 - a. Motor
 - b. Generator
 - c. Tire jack
 - d. Comb drive

4. Which of the following is an electrostatic actuator?
 - a. Motor
 - b. Generator
 - c. Tire jack
 - d. Comb drive

5. Which of the following is NOT a transducer and an actuator?
 - a. Motor
 - b. Generator
 - c. Bi-metallic strip
 - d. Comb drive

6. In microtechnology piezoelectric thin films are combined with metallic thin films to make
 - a. thermal switches
 - b. comb drives
 - c. strain gauges
 - d. RTDs

7. The property that determines how much a material expands when heated is called its _____ coefficient.
 - a. expansion
 - b. molecular
 - c. temperature
 - d. material

8. Which of the following micro-components could NOT be used to actuate?
 - a. Diaphragm
 - b. Comb drive
 - c. Cantilevers
 - d. Strain gauge

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