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

Introduction to Sensors Learning Module

This booklet contains four units:

Pre-test (Knowledge Probe)
Introduction to Sensor Primary Knowledge (PK) unit
Activity – What are Sensors?
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 “sensors” – 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 sensors and how they are used in everyday devices. Two related learning modules cover MEMS transducers and actuators.

Target audiences: High School, Community College, University

Made possible through grants from the National Science Foundation Department of Undergraduate Education #0830384, 0902411, and 1205138.

Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and creators, and do not necessarily reflect the views of the National Science Foundation.

Southwest Center for Microsystems Education (SCME) NSF ATE Center
© 2010 Regents of the University of New Mexico

Content is protected by the CC Attribution Non-Commercial Share Alike license.

Website: www.scme-nm.org

Introduction to Sensors

Knowledge Probe

Participant Guide

Introduction

This learning module is one of three SCME modules that discuss the types of components found in microelectromechanical systems (MEMS). This module covers “sensors” – 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 sensors and how they are used in everyday devices. Two related learning modules cover MEMS transducers and actuators.

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

1. A pressure sensor, barometer, gas flow sensor and altimeter are all examples of
 - a. thermal sensors
 - b. electrical sensors
 - c. chemical sensors
 - d. mechanical sensors

2. Which of the following BEST describes a sensor? 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. What type of MEMS sensor is currently used for biohazard detection, medical diagnosis, and food processing?
 - a. Thermal Sensor
 - b. Mechanical Sensor
 - c. Chemical Sensor
 - d. Electrical Sensor

4. Today’s airbag deployment sensors use micro-_____ to sense a particular motion requiring the need for airbag deployment.
 - a. gyroscopes
 - b. accelerometers
 - c. photodetectors
 - d. barometers

5. Which of the following is NOT a sensor?
 - a. Infrared thermometer
 - b. Geiger counter
 - c. Enose
 - d. Thermister

6. MEMS pressure sensors use a _____ over a reference chamber to sense a change in pressure and convert that change to an electrical output.
 - a. Gyroscope
 - b. Diaphragm
 - c. Capsule
 - d. RTD

7. A transducer is to a sensor as
 - a. the eyes are to the brain
 - b. the sun is to a plant
 - c. a book is to its cover
 - d. wood is to a fire

8. Characteristics of micro-sized sensors when compared to macro-sized sensors include
 - a. cheaper to mass produce, more accurate, less durable.
 - b. more expensive to mass produce, more accurate, more durable.
 - c. more reliable, more accurate, less durable.
 - d. more reliable, more accurate, longer-lasting.

Support for this work was provided by the National Science Foundation's Advanced Technological Education (ATE) Program through Grants. For more learning modules related to microtechnology, visit the SCME website (<http://scme-nm.org>).