**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

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Southwest Center for Microsystems Education (SCME) NSF ATE Center

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Website: [www.scme-nm.org](http://www.scme-nm.org)

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**Introduction to Sensors**

**Knowledge Probe**

**Instructor Guide**

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|  | Notes to the Instructor |
|  | This is the pre-assessment for the *Introduction to Sensors Learning Module.*  *Introduction to Sensors* is a Learning Module consisting of the following units:   * Knowledge Probe (Pre-assessment) * Introduction to Sensors * Activity: What are Sensors? * Final Assessment   This companion Instructor Guide (IG) contains both the questions and answers for the assessment questions. The answers are indicated in red. |
|  | 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. |

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|  | 1. A pressure sensor, barometer, gas flow sensor and altimeter are all examples of    1. thermal sensors    2. electrical sensors    3. chemical sensors    4. mechanical sensors |
|  | 1. Which of the following BEST describes a sensor? A device that    1. quantifies a value on its input and produces a readable output.    2. produces a readable output representative of a change.    3. converts one form of energy to another form of energy.    4. converts a change on the input into a proportional movement. |
|  | 1. What type of MEMS sensor is currently used for biohazard detection, medical diagnosis, and food processing?    1. Thermal Sensor    2. Mechanical Sensor    3. Chemical Sensor    4. Electrical Sensor |
|  | 1. Today’s airbag deployment sensors use micro- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to sense a particular motion requiring the need for airbag deployment.    1. gyroscopes    2. accelerometers    3. photodetectors    4. barometers |
|  | 1. Which of the following is NOT a sensor?    1. Infrared thermometer    2. Geiger counter    3. Enose    4. Thermister |
|  | 1. MEMS pressure sensors use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over a reference chamber to sense a change in pressure and convert that change to an electrical output.    1. Gyroscope    2. Diaphragm    3. Capsule    4. RTD |
|  | 1. A transducer is to a sensor as    1. the eyes are to the brain    2. the sun is to a plant    3. a book is to its cover    4. wood is to a fire |
|  | 1. Characteristics of micro-sized sensors when compared to macro-sized sensors include    1. cheaper to mass produce, more accurate, less durable.    2. more expensive to mass produce, more accurate, more durable.    3. more reliable, more accurate, less durable.    4. more reliable, more accurate, longer-lasting. |

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