

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

MEMS: Making Micro Machines Learning Module

This Learning Module supports the film by Silicon Run Productions:



A learning map is included that provides a suggested outline on how to use this module in the classroom. In order to complete the module, you need a copy of the film or access to the film online.

The film introduces MEMS (microelectromechanical systems), applications, fabrication, and design. This learning module provides activities to encourage the students to delve deeper into the topics introduced in the film and to demonstrate their understanding of the terminology and general concepts of MEMS.

Target audiences: High School, Community College, University

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Website: www.scme-nm.org



Notes to Instructor

The *MEMS: Making Micro Machines Learning Module* supports the film of the same name with activities and assessments. A DVD can be ordered through the SCME website while supply lasts (<http://scme-nm.org>) or you can purchase it or access it online via Silicon Run (<http://siliconrun.com/our-films/mems/>). The film “MEMS: Making Micro Machine” is an overview of microelectromechanical systems, produced and directed by Ruth Carranza of Silicon Run Production. The film and supporting activities can be used as an introduction to microdevices or MEMS – their applications, fabrication and design.

The *MEMS: Making Micro Machines Learning Module* support materials consist of the following:

- Knowledge Probe – Pre-assessment
- Activity 1 – Microfluidics
- Activity 2 – Optical MEMS
- Activity 3 – Sensors
- Supplement – Film Script
- Final Assessment

The Knowledge Probe (KP) is a pre-test that assesses a participant’s current knowledge of MEMS or microsystems applications, fabrication and design. The activities are designed to support the three (3) major sections of the film: Microfluidics, Optical MEMS and Sensors. It is recommended that you stop the film at the end of each section and have the participants complete the respective activity. A final assessment is provided to evaluate the knowledge gained as a result of viewing the film and completing the activities.

The film script is provided as a supplement to this learning module.

This Instructor Guide (IG) booklet contains all of the activities and assessments’ Instructor Guides as well as the Final Assessment for the participants. The IGs contain all of the answers to the activities and assessments.

Following is a suggested Learning Module Map.

Learning Module Map for MEMS: Making Micro Machines

The film introduces MEMS (microelectromechanical systems), applications, fabrication, and design. This learning module provides activities to encourage the students to delve deeper into the topics introduced in the film and to demonstrate their understanding of the terminology and general concepts of MEMS.

Learning Module units (5):

- Knowledge Probe
- Activity 1 – Microfluidics
- Activity 2 – Optical MEMS
- Activity 3 – MEMS Sensors
- Final Assessment

IMPORTANT STEPS	KEY POINTS	REASONS
Have the participants take the Knowledge Probe.		The Knowledge Probe is a pre-test that allows the participants to recognize how much they know and do not know about MEMS.
DVD – Part 1: Microfluidics	Show Part 1 of the film Have the participants complete Activity 1 – Microfluidics	If the crossword puzzle proves too hard, then suggest answering the Post-Activity questions first.
DVD – Part 2: Optical MEMS	Show Part 2 of the film Have the participants complete Activity 2 – Optical MEMS	If the crossword puzzle proves too hard, then suggest answering the Post-Activity questions first.
DVD – Part 3: Sensors and MEMS Design	Show Part 3 of the film Have the participants complete Activity 3 - Sensors	If the crossword puzzle proves too hard, then suggest answering the Post-Activity questions first.
Final Assessment	Have the participants complete the Final Assessment.	Compare results of the final assessment with those of the Knowledge Probe. Evaluate results.

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>).