

MODULE 040: THE PHOTOLITHOGRAPHY PROCESS ABSTRACT

Learning Activities	Time in Class	Outside Time
11	9.75 hrs	4 hrs

Overview:

More and more complex processors in smaller and smaller packages – the industry’s demands are pushing photolithography technology to create the tiniest features without sacrificing precision. This MATEC module can train students to meet the challenge. Stressing the physics of light and optics and the chemistry of dehydration and polymerization, MATEC develops your students’ comprehension of photolithography. They acquire the vocabulary to discuss this exacting process, from photoresist, mask, and reticle to integrated circuit pattern and g-, h-, and l-lines. When they finish the MATEC module, your students will be able to describe the purposes and parameters of photolithography; the rationales for soft baking resists, hard baking resists, and post-exposure baking resists; and the characteristics of positive and negative photoresists. Finally the MATEC module gives your students invaluable practical experience; they perform a hands-on processing of a silicon wafer, from surface preparation to baking a developed photoresist.

Module Contents:

Narrative

Overview

Learning Activity 01: Overview Of The Photolithography Process

Learning Activity 02: Photolithography Process Flow Table

Learning Activity 03: Surface Preparation And Application Of Photoresist

Learning Activity 04: Surface Preparation - Laboratory

Learning Activity 05: Surface Preparation - Research

Learning Activity 06: Surface Exposure

Learning Activity 07: Develop And Inspect Pattern In The Photoresist

Learning Activity 08: Exposure And Develop - Laboratory

Learning Activity 09: Mask And Registration Alignment Activity

Learning Activity 10: Photolithography Review-Crossword Puzzle

Learning Activity 11: Class Presentation Activity

Slide Show 01: Overview Of The Photolithography Process

contains videoclip "Photolithography Process"

Slide Show 02: Surface Preparation And Application Of Photoresist

contains videoclips "Photoresist Application", "Edge Bead Removal" and "Photoresist Dispense"

Slide Show 03: Surface Exposure

contains videoclip "Properties of UV Light", "Photoresist Mask"

Slide Show 04: Develop Pattern in the Photoresist

contains videoclip "Photoresist Develop"

Slide Show 05: Performance Assessment Masks

Performance Assessment 01: Performance Assessment