

# Modern Engineering Materials Instructional Laboratory

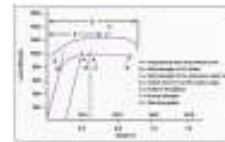
## Overview

- The lab is a central educational facility for testing mechanical, electrical, structural, and optical properties of materials
- An emphasis is placed on the connection between nanoscale structure of materials and macroscale properties
- Primarily for undergraduate instructional use, but available for graduate courses on a limited basis
- Shared among all departments in the College of Engineering

## Tension Testing



- Measurement of mechanical properties such as strength, elastic modulus, and ductility at the macroscale



## Torsion Testing



- Measurement of strength and rotation for materials during torsional loading

## Impact Testing



- Measurement of energy absorbed during impact loading for metals and plastics

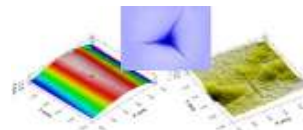
Close up of metal specimen just prior to impact >>>



## Hysitron Nano-Indenter

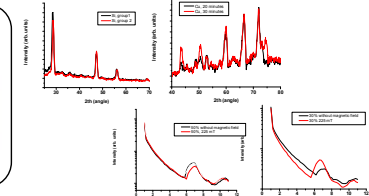


- Measurement of mechanical properties such as hardness and elastic modulus at the nanoscale

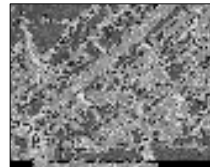


## X-Ray Diffractometer

- Measurement of the crystalline structure of materials: powder samples, textured samples and organic samples, thin films and nanometer scale samples

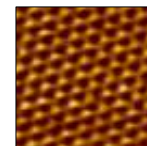


## Electron Microscope



- Visualization of materials, structures, and surfaces at the microscale

## Atomic Force Microscope



Graphite: 2nm x 2nm

- Visualization of materials, structures, and atoms at the nanoscale

## Classes Supported

Class	# Students	# Labs/Demos
ENAE 324	70	4
ENAE 423	70	2
ENES 102	150-300	2
ENES 220	200-250	3
ENMA 310	10-15	7-10
ENMA 311	10-15	7-10
ENMA 362	10-15	7
ENMA 489R	15	4
ENME 382	80-90	4