

Overview

Taught by Jennifer Hay, this 3-day course is a comprehensive introduction to nanoindentation. Lectures cover fundamental measurements and analyses for semi-static, oscillatory, and rapid nanoindentation. With an onsite KLA nanoindenter, students will practice changing tips, calibrating the area function, testing representative samples, and scripting test methods. Class size is limited to 12 people.

What students say...

"I just wanted to say thank you for the NI course. It was incredibly helpful for getting up to speed on NI and was perfectly timed. My dissertation project had to significantly shift at the last minute, but with your help, I was able to go from zero NI experience to learning the theory, verifying the machine, troubleshooting, and writing methods in three days. Not only has it helped our lab improve our verification methods, but your troubleshooting tips have especially saved me a lot of frustration and time." - Kenna

About the Instructor

Jennifer Hay is the owner of Applied Nanometrix, LLC, and she has 30 years of experience as an applications engineer in nanoindentation. Her work has garnered five U.S. patents and nearly 3000 scientific citations. She has a passion for introducing the next generation of experimentalists to nanoindentation--a technique that has revolutionized materials testing in the last 50 years. Her online lectures have been viewed by thousands of people.

Syllabus

Each day, morning sessions cover theory; afternoon sessions put the theory to use testing various classes of materials

Day 1. Lectures cover the differences between nanoindentation and microhardness, fundamental measurements of load and depth, and contact mechanics for interpretive models. Students practice testing steel, zirconia, and an industrial titanium-aluminum-nitride coating.

Day 2. Lectures cover dynamic nanoindentation and its applications, including instrument calibration, thin-film analysis, and frequency sweeps. Students learn how to calibrate the area function and frame stiffness of the instrument before testing a thin low-k film on silicon and a rubbery polymer. Students will also practice changing indenter tips.

Day 3. Lectures cover the structure of inView test methods, including variable types, test flow, and presentation. Students practice customizing test methods for alternate definitions of hardness, displacement control, large oscillations, and cantilever deflection.

Logistics

Dates: September 16-18, 2026

Hours: 8am – 5pm

Cost: \$1350 per person

Location: University of Tennessee Institute for Advanced Materials & Manufacturing (IAMM)
2641 Osprey Vista Way, Knoxville, Tennessee

Payment may be made online by credit card at appliednanometrix.com or by purchase order.

For more information, contact Jennifer Hay (865-804-9721, Jennifer@appliednanometrix.net).