Course Agenda

Measurements for Laser Safety (L-240)
A Hands-on Training Program

DAY ONE: Radiometric Units & Power/Energy Measurements

8:00 am	Registration
8:30 am	Review of Laser Technology Laser Fundamentals Laser Output Characteristics Laser Types and the Output Characteristics of Each (CW, pulsed, Q-switched, mode-locked; gas, solid state) Radiometric Quantities and Units Power and Pulse Energy Beam Spatial Characteristics Laser Safety Terminology
9:30 am	Fundamentals of Laser Measurements Laser Power and Energy Measurements Detector Types and Applications Accuracy of Measurements
10:00 am	Laboratory Experimental Series Measure Output Power of CW Lasers (Argon, HeHe, Nd:YAG, diode) Measure Output characteristics of Pulsed Lasers (Chopped Argon, AO Q-switched Nd:YAG)
12:00 pm	LUNCH
1:00 pm	Laser Beam Profiles Diameter of Gaussian Beams (1/e and 1/e2) Descriptions of Other Beam Shapes (Elliptical, rectangular, others) Discussion of Measurement Techniques
2:00 pm	Laboratory Experimental Series Determine Beam Profile and Size by Scanning the Detector Determine Beam Diameter by Measuring Transmission Through an Aperture
4:30 pm	End of Day

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DAY TWO: Beam Profile and Divergence

8:00 am	Sign In
8:30	Beam Divergence The Near Field and the Far Field Diameter of Focused Beams Discussion of Measurement Techniques
9:00 am	Laboratory Experimental Series Determining Divergence by Measuring Diameter at the Focal Point of a Lens Measuring Beam Divergence with a Ronchi Ruling
12:00 pm	LUNCH
1:30 pm	More Difficult Measurements Measurement Techniques for Diode Lasers Measurement Techniques for Low-Divergence Beams Temporal Measurements Discussion of M2 Measurements
2:00pm	Laboratory Experimental Series Measure the Divergence of a Diode Laser with Attached Collimating Optics Measure the Divergence of a Low-Divergence Beam Measure the Divergence of an IR Beam
4:30 pm	End of Day

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DAY THREE: Standards and Classification Measurement Methods

8:00 am	Sign In
8:30 am	Product Standards Classification Measurements Radiance and Extended Sources
10:00am	Discussion Session - Results of Each Experiment Discussed Additional Techniques - Burns, Photographs, Video, Others
11:00 am	Discussion Session - Questions, Answers Discussion of Selected Measurement Problems
12:00 pm	LUNCH
1:00 pm	Optional Laboratory and Discussions Discussions of Specific Measurement Problems Posed by Students
3:45 pm	Evaluations / Certificates
4:00 pm	End of Course