

INFRARED INSPECTIONS FOR WEATHERIZATION PROFESSIONALS

1. Course Overview

- Learning objectives
- Course terminology
- Weatherization defined
- Verification of weatherization retrofit work practices

2. Basic Infrared Theory and Heat Transfer

- Heat transfer modes
- Conduction, convection, and radiation
 - variables affecting rate of heat transfer
- Conductors and insulators
- Electromagnetic spectrum
- Discovery of infrared spectrum
- Emittance, reflectance, and transmittance
- Atmospheric transmission
- IR imaging systems and lens materials

3. Infrared Equipment

- Selection criteria
- Range and level settings
- Equipment set-up and operation
- Image interpretation and recording
- Equipment care and maintenance

4. Infrared Building Inspections

- Theory and component construction
- Applications of thermal imaging for weatherization
 - initial building condition assessment, project monitoring, final inspection
- Insulation and material characteristics
- Building energy loss
 - conduction and convection
- Air leakage
 - air infiltration and exfiltration

4. Infrared Building Inspections *(continued)*

- Inspection techniques
 - interior / exterior
- Weather variables and influences
- Error sources
 - wind, solar loading, surface moisture, building construction, building contents
- Required site conditions
 - creating sufficient Delta-T
- Thermal signatures
 - missing and damaged insulation
 - air leakage
 - thermal bypasses
 - latent moisture
 - pest damage
- Building Science
- Mold detection
- Inspection of building subsystems
- Verification of data
- Verification tools
- Data recording