

# Infrared Thermography - Level II

4.5 Days, 3.2 CEUs

Infrared Thermography Level II training is designed for the practicing IR Level II infrared camera user, and will benefit the student who has a desire to advance past the basics of infrared thermography. The course will expand past the basics of infrared theory. It will discuss how to operate the camera under different conditions, how to make a judgment of the measurement situation in the field and identify potential sources for error. After successfully completing this course the student will be able to do IR inspections following written guidelines, and will be able to report the results of the inspection using industry recognized standards. The student will interpret thermograms and make informed decisions using heat transfer concepts to analyze thermal images, and learn to distinguish between hot spots and reflections and direct versus indirect readings.

The learning objectives, contact hours and written exam of AVO Training Institute are based on the requirements outlined by ANSI/ASNT CP-105 and CP-189 of the American Society for Non-Destructive Testing. This course is suitable for use by employers, to certify their employees under ASNT's Recommended Practice No. SNT-TC-1A provided it is consistent with the employer's written practice.

## Certification Requirements

After completing the classroom portion of this course the student will be required to submit a complete infrared survey report within sixty days. The report will be graded as part of the final grade to receive an AVO Infrared Thermography Level II Certification.

## Pre-Requisites

A current IR Level I certification is required to be a participant in the IR Level II course. Please send a copy of a current and up-to-date IR Level I certification with the registration. (NO EXCEPTIONS)

Participants MUST provide their own: Infrared Camera, Reporting Software; Personal Computer.

## Lab and Classroom Attire

AVO is committed to the personal safety of each participant and requires appropriate wearing apparel for lab activities. Long pants and ANSI rated "safety toe" work shoes are acceptable as meeting this requirement.

## Learning Objectives

To receive 3.2 CEUs, participants must attend 4.5 days of class (32 contact hours) and attain a minimum average grade of 80% (overall grade will consist of 50% lab practice and 50% final exam). Upon completion of this course and lab practice, the participant will demonstrate that he/she is able to:

- Discuss more in depth concepts of heat transfer, infrared theory, and spatial resolution.
- Identify and practice thermal imaging survey and measurement techniques.
- Outline radiosity concepts.
- Explain the basics of predictive maintenance thermography and an inspection program.
- Summarize the different applications of thermography.

## SCOPE

### Day 1\* (7 contact hours)

- I. Introduction (0.5 hours)
    - A. Schedule
    - B. Course Outline
  - II. Introduction to Safety (0.5 hours)
    - A. Lab Safety Rules
    - B. On-the-Job Safety
- AM Break

### III. Heat and Temperature (6 hours)

- A. Heat
  - B. Temperature
- LUNCH
- C. Scales and Conversions
- PM BREAK
- LAB

### Day 2 (7 contact hours)

- IV. Basic Calculations in Three Modes of Heat Transfer (7 hours)
    - A. Modes of Heat Transfer
    - B. Conduction
- AM BREAK
- C. Convection
- LUNCH
- D. Radiation
- PM BREAK
- LAB

\*Class scheduling times may vary based on discussions and size of class

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## SCOPE (continued)

### Day 3 (7 contact hours)

- V. Infrared Spectrum (4 hours)
  - A. Electromagnetic Spectrum

AM BREAK

- A. Electromagnetic Spectrum (cont'd)

LUNCH

- VI. Radiosity Problems (3 hours)
  - A. Blackbody Theory and Concepts
  - B. Problems with Emissivity

PM BREAK

LAB

### Day 4 (7 contact hours)

- VII. Resolution Test and Calculations (7 hours)
  - A. Acronyms

AM BREAK

- B. Basic Infrared Camera Functions

LUNCH

- C. Things to Consider When Buying an Infrared Camera

PM BREAK

LAB

### Day 5 (half day) (4 contact hours)

- VIII. Conclusion (4 hours)
  - A. Review

AM BREAK

- B. Final Exam

# STANDARD EQUIPMENT LIST

## Infrared Thermography Level II Rev1

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Revised July 2018 by: Mike Carter/JJ  
Course number 240B  
4.5 days, 3.6 CEUs

### Text

1 / STUDENT

*Infrared Thermography Level II*  
Course 240B, Rev1, July 2018

### Equipment

1 / INSTRUCTOR

Infrared camera FLIR T400 series\*  
w/accessories and reporting software\*\*

1 / CLASS

Prop box (prepared by instructor)

**Note: students must make provision for their own cameras, software and personal computers.**

**If more than one student attends from the same client, equipment can be shared.**

\*(FLIR T420 is being rented for our first class)

### **Intellirent Company**

**Jeff Kirby**

**604 Henrietta Creek, Suite 400**

**Roanoke, tx 76262**

**T 972-317-0479**

**F 817-491-0068**

**[customerservice@intellirentco.com](mailto:customerservice@intellirentco.com)**

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1 bluetooth head set	1 sd card
1 shoulder strap	1 sun shield
1 usb power supply	1 usb to mini usb cable 20"
1 usb to mini usb cable 6'	1 user manual
1 video cable	2 batteries