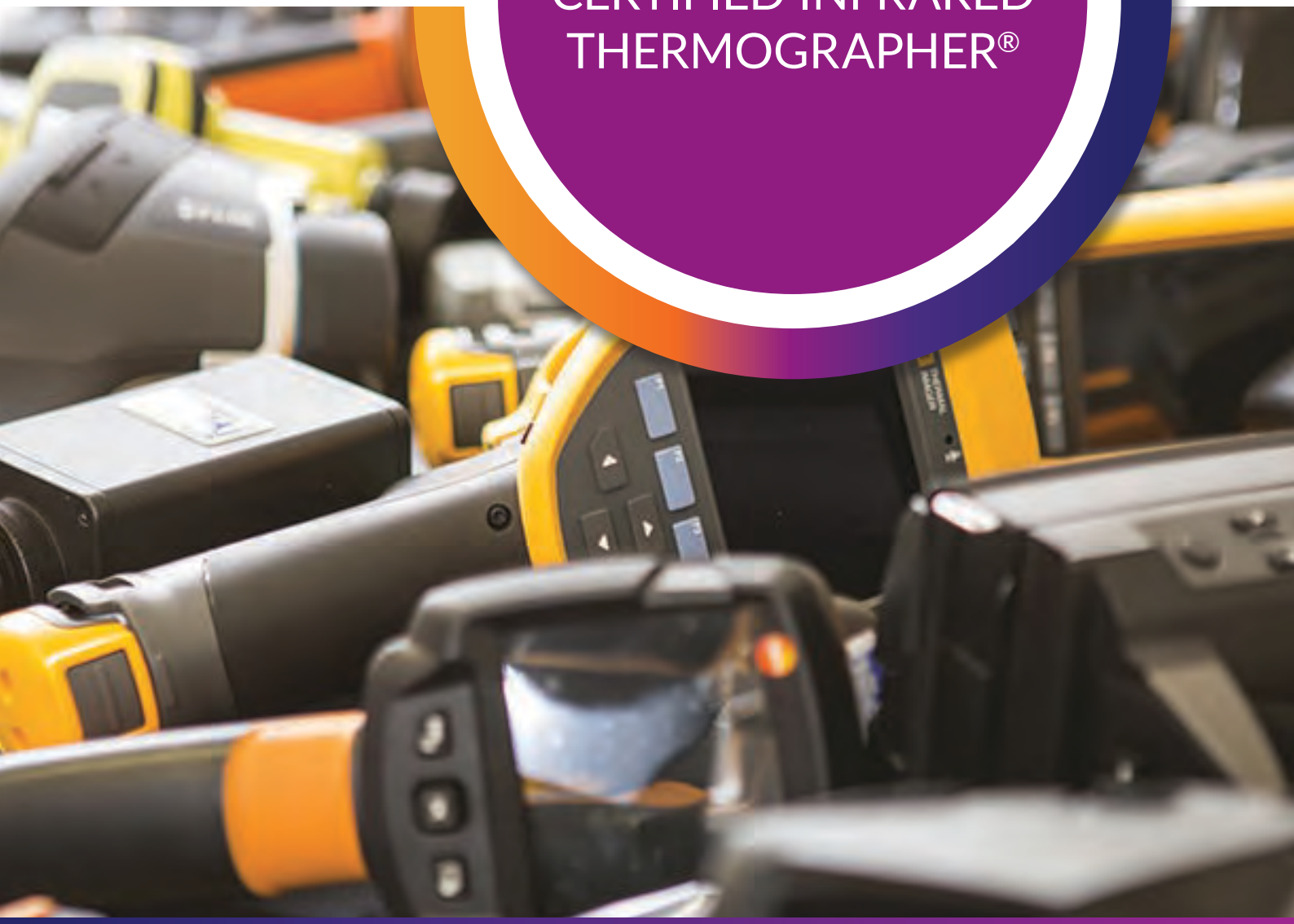
LEARNING
FOR PREDICTIVE MAINTENANCE TECHNOLOGIES

LEVEL 1
CERTIFIED INFRARED THERMOGRAPHER®



PRACTICAL TRAINING FOR REAL WORLD THERMOGRAPHY

WHY CHOOSE IPI LEARNING?

IPI Learning trains employees of large international corporations and standalone operators in cities across multiple countries. We provide the most comprehensive and progressive predictive maintenance training in the world. As a one stop training centre for predictive maintenance technologies, IPI Learning course subjects include:

IR

Infrared Thermography

Infrared Windows & Electrical Safety

Condition Monitoring

Vibration

Alignment

Airborne Ultrasound

> "Our training courses are designed to provide you with the skills you need to perform your surveys with confidence, competence and most importantly, results."

***Brenton Ward**, IPI Learning Trainer*

IPI Learning has been providing **expert predictive maintenance** services for almost 20 years.

- ✓ Training
- ✓ Sales support
- ✓ Professional consultancy to industry

Our Trainers have decades of **real world experience** and are qualified in training & assessment (TAE 40110) in Australia.

LEVEL 1
CERTIFIED INFRARED THERMOGRAPHER®

Designed for the application of Qualitative Thermal Imaging for:

- ✓ ***Predictive Maintenance***
- ✓ ***Condition Assessment***
- ✓ ***Condition Monitoring***
- ✓ ***Quality Assurance***
- ✓ ***Forensic Investigations***
- ✓ ***Building Sciences***

Course overview

This course covers:

Infrared theory, heat transfer concepts, equipment operation and selection, standards compliance, image analysis and report generation.

Students are trained to:

Identify and document thermal patterns caused by improper design, workmanship or material failure.

Specific applications include:

Electrical distribution systems, mechanical systems, steam systems, refractory systems, underground piping, active thermography, building envelopes and flat roofs.

Who should apply?

- Electrical Contractors
- Building & Pest Inspectors
- Energy Auditors
- Plant Maintenance Personnel
- Reliability Engineers
- **All thermographers**

Entry criteria

None

Further study

LEVEL 2 Certified Infrared Thermographer®

LEVEL 3 Certified Infrared Thermographer®

LEVEL 4 Master Thermographer®

Inclusions (Fees)

Course tuition includes: all course presentations, Student Reference Manual, trial version of Exception Data Management & Report Generation Software® and the Infraspection Institute Certified Infrared Thermographer® exam (Flexible Learning and Classroom Learning only, extra exam fees will apply for Distance Learning). This course is fully catered.

Student support

Comprehensive websites
infraredtraining.com.au
cita.org.au

Onsite consulting & mentoring
Program setup
Program audits
Onsite training and mentoring

Free advice from expert thermographers
Email training@infraredtraining.com.au
Web forum cita.org.au

TYPES OF TRAINING

Classroom Learning

Undertake your training in a classroom setting dedicated to your learning.

- Freedom from the constant distractions of the office
- Opportunity to meet with other professionals from around the world
- Ability to test drive several types of infrared cameras

Open enrolment courses are regularly held in Melbourne and at other locations throughout Australia.

Flexible Learning

Complete the theoretical portion of your certification in your own time and enjoy the interactive benefits of classroom learning for the practical experiments & equipment operation.

Perfect for people who:

- Prefer to gain hands on experience under the guidance of a practising thermographer
- Don't have time to spend 5 days in a classroom
- Are self-employed contractors who need to study after hours or to juggle training with work commitments
- Are essential employees who need the flexibility to study in between doing their daily tasks at work

Distance Learning

Take your infrared training wherever and whenever it's convenient for you. With IPI Learning's Distance Learning course, you get the same quality content for which we are famous.

- We utilize state-of-the-art web servers and dynamic multimedia resources to provide a unique, quality educational experience
- Distance Learning Courses are divided into narrated one-hour online infrared lecture training units allowing you to work at a pace that's convenient for you

LEVEL 1
CERTIFIED INFRARED THERMOGRAPHER®

Course name	Level 1 Certified Infrared Thermographer®
Course code	CIT1
Entry requirements	None
Study mode	Classroom Learning, Flexible Learning, Distance Learning, Onsite Learning, Refresher Course
CLASSROOM Learning Course Times	**36 hours comprising:** **Classroom Learning and written exam (5 days)** Monday-Thursday 8.00am – 5.00pm Friday 8.00am – Noon **Times may vary for some locations**
FLEXIBLE Learning Course Times	**36 hours comprising:** **Online Learning** **Classroom Learning and written exam (3 days)** Wednesday-Thursday 8.00am – 5.00pm Friday 8.00am – Noon **Times may vary for some locations*
DISTANCE Learning	**36 hours comprising:** Online Learning Practical assessment Written exam
Locations	Melbourne, Sydney, Brisbane, Perth, New Zealand
Trainers	Brenton Ward Garry Ward
Assessment	Written exam, Practical assessment

Certification & Recognition

INFRASPECTION INSTITUTE

This program is compliant with international standards ISO-18436 and ASNT SNT-TC-1A. This course is also approved by the InterstNational Association of Certified Home Inspectors and meets the training requirements for their Infrared Certified professional designation and logo.

CERTIFIED INFRARED THERMOGRAPHER'S ASSOCIATION (CITA)

CITA provides a secondary certification program to endorse your skills and training.

Our program ensures that you meet the requirements set forth by the following standards:

- SNT-TC-1A
- ISO 18436

AUSTRALIAN INSTITUTE OF NON DESTRUCTIVE TESTING (AINDT)

At the completion of the course students may also apply for 3rd party certification through the AINDT.

MOBIUS INSTITUTE BOARD OF CERTIFICATION

IPI Learning is a Mobius Institute Authorise Examination Centre, authorised to conduct MIBoC certification examinations for Infrared Thermography according to ISO 18436 and ISO/IEC 17024. To become MIBoC certified, an additional examination is required at the end of your Certified Infrared Thermography course.

LEVEL 1
CERTIFIED INFRARED THERMOGRAPHER®

COURSE OUTLINE

<table>
<tr><th></th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td>7.45am</td><td>Registration</td><td colspan="3">Optional hands-on operation of images</td><td rowspan="2">Questions
& Course
Wrap up</td></tr>
<tr><td>8.00am</td><td>Course Overview
& Ground rules</td><td rowspan="2">Image
Operation &
Selection</td><td rowspan="2">Rotating
Equipment Theory
Detectable Defects
Conducting Inspections
Energy Loss
Radiation
Convection
Conduction
Safety Practices
Data Confirmation
Standards & Reporting</td><td rowspan="5">Structural Inspectons
Theory
High/Low Temp Apps
Detectable Defects
Conducting Inspections
Energy Losss
Radiation
Convection
Conduction
Safety Practices
Data Confirmation
Standards & Reporting</td></tr>
<tr><td>9.00am</td><td>Introductions</td><td rowspan="5">Written
Exam</td></tr>
<tr><td>10.00am</td><td>Overview of IR
Applications</td><td>Electrical Systems
Inspections
Theory
Detectable Defects
Conducting
Inspections</td><td>Power Transmission
& Alignment</td></tr>
<tr><td>11.00am</td><td>Heat Transfer
Concepts</td><td>Steam &
Fluid Systems</td></tr>
<tr><td>Noon</td><td colspan="4">Lunch</td></tr>
<tr><td>1.00pm</td><td>Heat Transfer
Concepts</td><td rowspan="2">Electrical Systems
Inspections
Safety Practices
Data Confirmation
Standards &
Reporting</td><td>Active Thermography
Theory & Applications</td><td rowspan="2">Insulated Roof
InspectionsTheory
Detectable Defects
Conducting Inspections
Safety Practices
Data Confirmation
Standards & Reporting</td><td rowspan="5"></td></tr>
<tr><td>2.00pm</td><td rowspan="2">Basic Infrared
Theory &
Thermal Imaging
Systems</td><td>Recording Images
& Producing
Hardcopy</td></tr>
<tr><td>3.00pm</td><td>Nine Steps to Setup
an IR Program</td><td>Generating a
Qualitive IR Report</td><td rowspan="2">Workshop
Introduction
to Quantitive
Analysis</td></tr>
<tr><td>4.00pm</td><td>Workshop
E,R & T
Emittance,
Reflectance &
Transmittance</td><td>Workshop
Image
Operation</td><td>Workshop
Standards & Reporting
Using Data Managment
& Reporting Software</td></tr>
<tr><td>5.00pm</td><td colspan="4">End of Day</td></tr>
</table>

LEVEL 1
CERTIFIED INFRARED THERMOGRAPHER®

COURSE OUTLINE

1 Equipment & Data Acquisition

- How your infrared camera works
- Spectral band
- Temperature measurement range
- Lens selection
- Optical resolution
- Operation of equipment
- Accessories
- Camera controls
- ISO 18434-1
- Safe data acquisition
- Getting a good image
- Image composition
- Image clarity (optical focus)
- Thermal tuning (range, level and span)
- Palette selection
- Emissivity determination
- Error source recognition, prevention or control
- Recognizing and dealing with radiation (refletions, reflected apparent temperature)
- Recognizing and dealing with convection
- Recognizing and dealing with conduction
- Effects of incorrect emissivity
- Camera calibration
- Environmental and operational conditions
- Data and image storage

2 Reporting & Documentation

- Report writing
- Thermographers 'and end-users' responsibilities

3 Principles of Infrared Thermography (IRT)

- Heat and heat transfer
- Conduction fundamentals
- Conductivity/resistance
- Convection fundamentals
- Radiation fundamentals
- Electromagnetic spectrum
- Atmospheric transmission
- IR wavebands and lens materials
  Stefan-Boltzmann Law
- Emittance, reflectance and transmittance
- Emissivity
- Factors affecting emissivity

4 Image Processing

- Temperature measurement
- ISO 18434-1
- Non-contact thermometry
- Comparative quantitative thermography
- Comparative qualitative thermography
- Environmental influences
- Camera measurement tools
- Measurement tools
- Palette selection
- Level and span adjustment
- Distance (atmospheric) correction
- Image montage
- Temperature trending
- General image interpretation guidelines

5 Condition Monitoring Applications

- Machinery engineering principles (components and construction)
- Typical machinery failure modes and mechanisms and their associated thermal signatures
- Severity assessment and acceptance criteria (engineering codes and standards)
- Safety issues
- ISO 18434-1

6 General Applications

- Discussion on general industrial applications
- Active and passive thermography

7 Condition Monitoring Programme Design

- General principles
- Reference temperatures
- Baseline temperatures

8 Condition Monitoring Programme Implementation

- Overview
- Safe systems of work

9 Condition Monitoring Programme Management

- Safety management
- Equipment management
- Database management

10 Diagnostic & Pronostics

- Basic principles of diagnostics (ISO 13379)

11 Training examination

To register and see our course schedule visit:

infraredtraining.com.au

Register directly on the training website or complete the registration form included in this information pack and return it by email to: training@infraredtraining.com.au

For further information

or to find out about our course schedules and locations please contact us.

Melbourne
12/634-644 Mitcham Rd Vermont VIC 3133
Phone: 1300 781 701 (Australia)
1-909-547-3300 (USA)
+61 3 9872 5055 (International)
Email: training@infraredtraining.com.au
Web: infraredtraining.com.au
@ipilearning

LEARNING
FOR PREDICTIVE MAINTENANCE TECHNOLOGIES