205050 - Infrared Thermography for Building Diagnostics

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering
Academic year: 2019
Degree: MASTER’S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
MASTER’S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
MASTER’S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: English

Teaching staff
Coordinator: Blanca Tejedor

Teaching methodology
The teaching methodology is focused on performing some tests and practices in relation with the concepts exposed over the course. The main aim is to establish a useful guideline for the student in order to detect anomalies and determine thermal properties of building elements. Like this, the student may propose improvements and solutions regarding building refurbishment.

Learning objectives of the subject

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group: 27h</th>
<th>36.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group: 0h</td>
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<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study: 48h</td>
<td>64.00%</td>
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</tbody>
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## Content

### Module 1: Introduction to Infrared thermography

**Learning time:** 32h  
Theory classes: 12h  
Self study: 20h

**Description:**  
- Energy Audit Process  
- What is IRT? Definition and Applications  
- Infrared Camera: How capture an image  
- Heat Transfer in relation with IRT

**Related activities:**  
- What is the correlation between the variables to be measured and instruments to be used?  
- To develop a document and presentation about a specific application where IRT is relevant. The background of such application is required  
- To enumerate and explain what conditions are needed for inspections or tests by IRT  
- To practice with an IR camera and Software FLIR TOOLS

### Module 2: IRT for building diagnostics

**Learning time:** 43h  
Theory classes: 15h  
Self study: 28h

**Description:**  
- Techniques of measurement and assessment  
- Interpretation of a thermogram  
- IRT for building refurbishment

**Related activities:**  
- How detect anomalies by qualitative IRT  
- To practice different techniques of measurement and assessment in different case studies.  
- To analyze a sequence of thermograms recorded in a specific data acquisition interval by IR camera.  
- To determine thermal properties of a building façade.  
- To describe solutions for anomalies detected in buildings by IRT. It can be used techniques of refurbishment

## Qualification system

20% (ATTENDANCE & PARTICIPATION IN CLASS) + 80% PRACTICES

## Bibliography

**Others resources:**  
Material attached in virtual Campus