

220128 - Energy Efficiency Systems

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:	BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits:	3
Teaching languages:	English

Teaching staff

Coordinator: Joan Carles Fernández Vallés

Teaching methodology

The course is divided into parts:

Theory classes

Practical classes

Self-study for doing exercises and activities.

In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.

In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.

Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject

To introduce the student into a new way to analyze different systems taking into consideration the energetic point of view. Public buildings, transport and industries examples will be analyzed in order to reach improvements in their energetic costs.



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Study load

Total learning time: 75h	Hours large group:	30h	40.00%
	Self study:	45h	60.00%

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Content

<p>Module 1: Energy Audits</p>	<p>Learning time: 14h Theory classes: 6h Self study : 8h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Definitions 2. Basic Energy concepts 3. Units 4. Introduction to the bills comprehension 5. Energy audits (Steps, scope) 	
<p>Module 2: Building Energy Audit</p>	<p>Learning time: 14h Theory classes: 6h Self study : 8h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Introduction 2. Building concepts 3. Lighting concepts 4. Heating and cooling 5. First exercise definition 	
<p>Module 3: Energetic improvements in Transport.</p>	<p>Learning time: 14h Theory classes: 6h Self study : 8h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. First exercise presentation 2. Introduction to the energetic consumption in the transport 3. Aeronautics energetic improvements 4. Railway energetic improvements 5. Automotive energetic improvements 	

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Module 4: Industrial energetic assessment	Learning time: 14h Theory classes: 6h Self study : 8h
Description: 1. Introduction 2. Electrical energy management 3. Energetic improvements in the industry 4. Second exercise definition	
Module 5: Second exercise presentation	Learning time: 19h Theory classes: 6h Self study : 13h
Description: 1. Presentations	

Qualification system

The final grade will be calculated based on:

$$NT = 0,4 \times N1 + 0,5 N2 + 0,1 NC$$

Being:

NT: Final Grade

N1: First Exercise qualification

N2: Second Exercise qualification

NC: Contribution to the meetings

Bibliography

Basic:

Thumann, Albert; Younger, William J; Niehus, Terry. Handbook of energy audits. 8th ed. Lilburn GA : New York, NY: Fairmont Press ; Distribution by Marcel Dekker, cop. 2009. ISBN 9781439821459.

Complementary:

Doty, Steve; Turner, Wayne C. Energy management handbook. 7th ed. Lilburn, GA : Boca Raton, FL: Fairmont Press ; Distributed by Taylor & Francis, cop. 2009. ISBN 9781420088700.

Others resources:

Class notes