

820769 - EEI - Industrial Energy Efficiency

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 709 - EE - Department of Electrical Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN ENERGY ENGINEERING (Syllabus 2013). (Teaching unit Optional)
MASTER'S DEGREE IN ENERGY ENGINEERING (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5 Teaching languages: English

Teaching staff

Coordinator: ANDREAS SUMPER
Others: Second semester:
ANDREAS SUMPER - T10, T20, T30
JORDI CADAFALCH - T10, T20, T30
Konuray, Ali Osman

Opening hours

Timetable: M 15-17H

Degree competences to which the subject contributes

Specific:

CEMT-4. Efficiently collect data on renewable energy resources and their statistical treatment and apply knowledge and endpoint criteria in the design and evaluation of technology solutions for using renewable energy resources, for both isolated systems and those connected to networks. They will also be able to recognise and evaluate the newest technological applications in the use of renewable energy resources.

CEMT-3. Assess the economic, social and environmental impact of the production, use and management of energy, with a holistic view of the life cycle of the different systems, and recognise and value the most remarkable developments in the fields of energy efficiency and the rational use of energy.

CEMT-5. Employ technical and economic criteria to select the most appropriate thermal equipment for a given application, dimension thermal equipment and facilities, and recognise and evaluate the newest technological applications in the production, transportation, distribution, storage and use of thermal energy.

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Teaching methodology

During the development of the course will be used the following teaching methods:

- Lecture or conference (EXP): exhibition of knowledge by teachers through lectures by guest speakers.
- Participatory classes (PART): collective resolution of exercises, conducting debates and group dynamics with the teacher and other students in the classroom; presentation of a classroom activity performed individually or in small groups.
- Work conducted theoretical and practical (TD): completion of a classroom activity or exercise theoretical or practical, individually or in small groups, with the advice of the teacher.
- Project, with reduced work scope (PR): learning based on the conducting individual or group to work reduced complexity or length, applying knowledge and presenting results.
- Project with large work scope (PA): based learning design, planning and implementation of a project or group work full complexity or length, applying and expanding knowledge and writing a report poured This approach and the results and conclusions.
- Evaluation Activities (EV).

Learning objectives of the subject

To know the most important technologies and methodologies for Energy Efficiency in Industrial Energy Systems

- Understand the most important energy technologies both electrical and thermal
- Understand the energy efficiency methodologies
- Acquire knowledge on optimization for efficiency problems
- Understand and solve specific problems in engineering

Study load

Total learning time: 120h	Hours small group:	30h	25.00%
	Guided activities:	10h	8.33%
	Self study:	80h	66.67%

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Content

<p>Introduction</p>	<p>Learning time: 14h Theory classes: 2h Practical classes: 2h Self study : 10h</p>
<p>Description: Introduction to energy efficiency. Specific objectives: Understand the most important energy technologies, both electrical and thermal.</p>	
<p>Lighting</p>	<p>Learning time: 23h Theory classes: 4h Practical classes: 2h Guided activities: 2h Self study : 15h</p>
<p>Description: Lighting technology for industrial applications.</p>	
<p>Industrial heating</p>	<p>Learning time: 29h Theory classes: 4h Practical classes: 4h Laboratory classes: 2h Guided activities: 4h Self study : 15h</p>
<p>Description: Industrial heating techniques</p>	
<p>Motors, drives and power electronics</p>	<p>Learning time: 59h Theory classes: 5h Practical classes: 7h Laboratory classes: 3h Guided activities: 4h Self study : 40h</p>
<p>Description: Motors, drives and power electronics</p>	

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Qualification system

Written test (PE). 40 %

Oral test (PO). 0 %

Work done individually or in groups throughout the course (TR). 30 %

Attendance and participation in classes and laboratories (AP). 20 %

Quality and performance of group work (TG). 10 %

Bibliography

Basic:

Thollander, Patrik; Palm, Jenny. Improving energy efficiency in industrial energy systems [on line]. London: Springer, 2013 [Consultation: 06/10/2016]. Available on: <<http://dx.doi.org/10.1007/978-1-4471-4162-4>>. ISBN 9781447141617.

Sumper, Andreas; Baggini, Angelo. Electrical energy efficiency : technologies and applications [on line]. United Kingdom: John Wiley & Sons, 2012 [Consultation: 06/10/2016]. Available on: <<http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10542505>>. ISBN 9780470975510.