

820731 - ESEC - The Power Grid System (DRAFT VERSION)

Coordinating unit: 820 - EUETIB - Barcelona College of Industrial Engineering
 Teaching unit: 721 - FEN - Department of Physics and Nuclear Engineering
 Academic year: 2014
 Degree: MASTER IN ENERGY ENGINEERING (Syllabus 2013). (Teaching unit Compulsory)
 ECTS credits: 5 Teaching languages: English

Teaching staff

Coordinator: Pretel Sanchez, M. Del Carmen
 Others: Cortes Rossell, Guillem Pere
 Villafáfila Robles, Roberto

Opening hours

Timetable: To arrange by e-mail

Degree competences to which the subject contributes

Specific:

CEMT-2. Identify and describe the components of electrical systems (production, transportation, distribution, markets, procurement and consumption) and evaluate the technological solutions used in the production of electricity.

Teaching methodology

Theoretical lectures
 Practical sessions
 Guided work

Learning objectives of the subject

To describe the different technologies related to the production of electric energy
 To have an insight into the more significant aspects of electricity transportation and distribution
 To apply the acquired knowledge to solve practical cases

Study load

Total learning time: 125h	Hours large group:	30h	24.00%
	Hours medium group:	0h	0.00%
	Hours small group:	0h	0.00%
	Guided activities:	15h	12.00%
	Self study:	80h	64.00%

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Content

<p>Topic 1: Introduction</p>	<p>Learning time: 3h Large group/Theory: 2h Self study : 1h</p>
<p>Description: This first topic describes the main characteristics of the structure of the spanish power system, concerning both demand and production.</p> <p>Specific objectives: To give the students a general overview of the spanish power system.</p>	
<p>Topic 2: Electrical energy production</p>	<p>Learning time: 35h Large group/Theory: 14h Guided activities: 7h Self study : 14h</p>
<p>Description: Description of different technologies of electrical energy production: Coal-fired power plants, combined cycle power plants, nuclear power plants, hydroelectric power plants, wind parcs and solar facilities (FV and thermal-solar). For each one of these tecnologies the operating principle, equipment, environmental impact and other relevant aspects are presented.</p> <p>Related activities: Resolution of practical cases</p>	
<p>Topic 3: Transport and distribution</p>	<p>Learning time: 26h Large group/Theory: 10h Guided activities: 6h Self study : 10h</p>
<p>Description: Description of the main characteristics of transport and distribution infrastructures (transmission and distribution systems, transforming stations and conversion stations) Analysis of the technological aspects related to the grid regulation.</p> <p>Related activities: Calculation of power lines. Resolution of practical cases.</p> <p>Specific objectives: Students should know the difference between transport and distribution. They should be aware of the causes of electrical energy losses during its transport and distribution in order to reason about maximum lengths of the grid. Students should know the main characteristics of transport and distribution infrastructures.</p>	



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Qualification system

Evaluation of the guided activities
Final exam