

Partner University		Universitat Politècnica de Catalunya · BarcelonaTech																									
Degree		MSc Energy Engineering																									
Code	820731	Name	The power grid system																								
ECTS	5	Year	1	Semester	1	Character	Mandatory																				
Pre-requisites		<ul style="list-style-type: none"> Thermodynamics fundamentals Electrical engineering fundamentals 																									
Objectives		<ul style="list-style-type: none"> Introduce the different technologies involved in the production of electricity, making particular emphasis on its fundamental characteristics, environmental impact and efficiencies. Address the most important aspects related to the transport and distribution of electricity. 																									
Learning outcomes		<p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> Demonstrate a good knowledge and understanding of the structure of the electrical system; the role of the electrical system in the context of a global energy system; and the systems and technologies involved in the production of electricity, their fundamental characteristics, their efficiency, and their environmental impact. Perform studies on the design, evaluation, selection and implementation of systems for electricity production. Demonstrate a good knowledge and understanding of the most significant aspects of the transmission and distribution of electricity. Demonstrate awareness to the importance of issues such as energy efficiency; environmental impact, security of energy supply. 																									
Course main content		<ol style="list-style-type: none"> Introduction Structure of the electric sector: production and demand. Production Scheme and operation principles, efficiencies, equipment and environmental impact of the following technologies: Thermal plants (Steam cycle power plants, gas cycle power plants, combined cycle power plants, solar thermoelectric power plants, nuclear power plants); Hydropower plants; Wind power plants; Others. Transport and distribution of electric power. Introduction (difference between transport and distribution. Power losses. Maximum lengths). 																									
Methodology		<p>Lectures, practical sessions, exercises and assignments.</p> <p>Student workload (hours)</p> <table border="1"> <tr> <td>Lectures</td> <td>30</td> <td>Tutoring sessions</td> <td>15</td> </tr> <tr> <td>Practical sessions</td> <td>15</td> <td>Homework assignments</td> <td>30</td> </tr> <tr> <td>Laboratory</td> <td>0</td> <td>Projects</td> <td>0</td> </tr> <tr> <td>Presentations</td> <td>0</td> <td>Autonomous Study</td> <td>35</td> </tr> <tr> <td colspan="3">TOTAL</td> <td>125</td> </tr> </table>						Lectures	30	Tutoring sessions	15	Practical sessions	15	Homework assignments	30	Laboratory	0	Projects	0	Presentations	0	Autonomous Study	35	TOTAL			125
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Bibliography:																											
Student assessment		Exam 70%		Homework assignments 30%																							
Contact person		Carme Pretel http://directori.upc.edu/directori/dadesPersona.jsp?id=1002326																									
Link																											