

340229 - GSEP-E7P09 - Management of Electric Power Systems and Energy Saving Methods

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit: 709 - EE - Department of Electrical Engineering
Academic year: 2019
Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6 Teaching languages: Catalan

Teaching staff

Coordinator: Ramon Caumons Sangrà
Others: Ramon Caumons Sangrà

Degree competences to which the subject contributes

Specific:

1. CE24. Knowledge of electrical power systems and its applications.

Transversal:

2. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
3. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Teaching methodology

- In the lectures will be presented and developed the theoretical foundations of programmed materials. Consist of theoretical explanations complemented by activities to encourage participation, discussion and critical analysis by students.
- In the kinds of problems were raised and solved exercises for the areas covered. Students have to solve, individually or in groups, indicating problems.
- It will realised group work or individual work during the year related to a specific topic of the course.

Learning objectives of the subject

On this subject the pricing of electricity, energy conservation, energy efficiency, energy audits and energy certification is. In power systems programming is generating .



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Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

<p>-1: Pricing of electricity.</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. General billing on electricity. Liberalisation of the electricity sector . 2. Billing energy. 3. Practical considerations about the compensation of the reactive power . 4. Types of compensation : Global, partial and individual . 5. Determination practical battery capacitors for reactive power compensation of a facility ? Setup . 6. counter. Schemes measure. 	
<p>-2: Energy savings.</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description:</p> <ol style="list-style-type: none"> 7. Introduction 8. Primary sources of energy. 8. Units of energy . 10. current energy situation . 11. Efficiency and energy saving. 12. Plan ? Energy 2012-2020 13. Legislative Framework . Basic Document HE . RITE 14. Buildings Energy quasi null 15. CO2 Emissions 	
<p>-3 Energy audit.</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description:</p> <ol style="list-style-type: none"> 16. Introduction. 17. Regulations: UNE-EN 16247. 18. Data Collection . 19. Accounting energy . 20. Examples of ? Audits . 21. Energy services companies . 22. Rating investment : NPV, IRR ... 	

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<p>-4 : Energy certification . Energy label.</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description: 23. Introduction. 24. Regulations . 25. Energy Certification's buildings. Energy label. 26. Software certification. 27. Examples</p>	
<p>-2: Energy efficiency in facilities and equipment.</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description: 28. Air . 29. Ventilation. 30. Lighting. 31. Energy efficiency in street lighting. Regulations. 32. Electrical installation . 33. systems of regulation and control. 34. Maintenance . 35. Efficient water management . 36. Electric Drives High Performance. 37. Appliances . Energy label . 38. Section economic and ecological cables in LV.</p>	
<p>-4:Scheduling generation</p>	<p>Learning time: 25h Theory classes: 7h 30m Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description: 39. Bureau of Economic classical thermal generation. 40. Programming Time static. 41. Startup and Shutdown "unit Commitment." 42. Hydrothermal Office. 43. Optimization methods</p>	

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PRACTICES	Learning time: 0h Guided activities: 0h
<p>Description:</p> <ol style="list-style-type: none"> 1: Power measurement: The meter and the network analyzer. 2: Energy audit of a building. 3: Energy certification of a building 	

Qualification system

60 % theory.
40 % practices.

REEVALUATION:

If the EPSEVG establishes reevaluation for this subject, it will be done according to its regulations. The re-evaluable part would correspond to the exams (60%).

Regulations for carrying out activities

- The written tests are classroom and individual.

Bibliography

Basic:

Reglamento de instalaciones térmicas en los edificios, RITE : Real Decreto 1027/2007 de 20 de julio : incluye instrucciones técnicas complementarias. 7a ed. Madrid: Paraninfo, 2013. ISBN 9788428395649.

Espanya. REEA : reglamento de eficiencia energética en instalaciones de alumbrado exterior : y sus instrucciones técnicas complementarias ITC-EA 01 a 07 : Real Decreto 1890/2008 de 14 de noviembre. Madrid: Garceta, 2009. ISBN 9788493720803.

UNE-EN 16247-2 : Auditorías energéticas. Parte 2: Edificios. Madrid: AENOR, 2014.

Grainger, John J.; Stevenson, William D. Jr. Análisis de sistemas de potencia. 1996. México [etc.]: McGraw-Hill, 1996. ISBN 9701009088.

"Parte 1: Requisitos generales". UNE-EN 16247-1:2012. Madrid: AENOR, 2012.