

220250 - Electrical Power Systems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
 Teaching unit: 709 - EE - Department of Electrical Engineering
 Academic year: 2019
 Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
 ECTS credits: 5 Teaching languages: Catalan

Teaching staff

Coordinator: RAMON MUJAL ROSES.

Degree competences to which the subject contributes

Specific:

1. Capability for modeling, analysis, calculation and design of electrical power systems.
2. Ability to calculate and design electrical machines and actuators, with knowledge of efficient electrical systems and efficient control of electrical drives.
3. Ability to project conventional and non-conventionals power facilities.
4. Knowledge to data integration and industrial communications.
5. Knowledge to the management and monitoring of automated information processes energy.
6. Ability to model and solve problems associated with the operation of electric power systems by integrating information technologies and communication: protection, network operation, and electricity market stability.

Learning objectives of the subject

Study load

Total learning time: 125h	Hours large group:	30h	24.00%
	Hours small group:	15h	12.00%
	Self study:	80h	64.00%

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Content

(ENG) Mòdul 1. L'electricitat i les seves fonts d'energia	Learning time: 15h Theory classes: 3h Laboratory classes: 2h Self study : 10h
(ENG) Mòdul 2. Màquines elèctriques i centres de transformació	Learning time: 16h Theory classes: 3h Laboratory classes: 3h Self study : 10h
(ENG) Mòdul 3. Paràmetres elèctrics i càlcul de xarxes	Learning time: 17h Theory classes: 5h Laboratory classes: 2h Self study : 10h
(ENG) Mòdul 4. Sistemes de Protecció. Posada a terra	Learning time: 16h Theory classes: 3h Laboratory classes: 3h Self study : 10h
(ENG) Mòdul 5. Regulació i control de sistemes elèctrics	Learning time: 17h Theory classes: 5h Laboratory classes: 2h Self study : 10h
(ENG) Mòdul 6. Fallades simètriques en sistemes elèctrics de potència	Learning time: 16h Theory classes: 3h Laboratory classes: 3h Self study : 10h



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<p>(ENG) Mòdul 7. Fallades asimètriques. Xarxes de seqüència i components simètriques</p>	<p>Learning time: 14h Theory classes: 4h Self study : 10h</p>
<p>(ENG) Mòdul 8. Funcionament econòmic dels sistemes elèctrics</p>	<p>Learning time: 14h Theory classes: 4h Self study : 10h</p>

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Planning of activities

(ENG) ACTIVITAT 1: PROBLEMES I PRÀCTICA SOBRE MÀQUINES ELÈCTRIQUES	Hours: 11h Laboratory classes: 2h Self study: 6h Theory classes: 3h
(ENG) ACTIVITAT 2: PROBLEMES I PRÀCTICA SOBRE LINIES ELECTRICAS. REGULACIÓ	Hours: 13h Laboratory classes: 3h Self study: 7h Theory classes: 3h
(ENG) ACTIVITAT 3: PROBLEMES I PRACTICA DE L'ANÀLISI DE CORTCIRCUITS EQUILIBRATS	Hours: 14h Laboratory classes: 2h Self study: 7h Theory classes: 5h
(ENG) ACTIVITAT 4: PROBLEMES I PRACTICA DE XARXES DE SEQÜÈNCIA I COMPONENTS SIMÈTRICS	Hours: 13h Laboratory classes: 3h Self study: 7h Theory classes: 3h
(ENG) ACTIVITAT 5. FUNCIONAMENT ECONÒMIC DELS SISTEMES DE POTENCIA	Hours: 13h Laboratory classes: 2h Self study: 6h Theory classes: 5h
(ENG) ACTIVITAT 6: PROBLEMES I PRACTICA DE PROTECCIONS I POSADA A TERRA	Hours: 13h Laboratory classes: 3h Self study: 7h Theory classes: 3h
(ENG) ACTIVITAT 7: CLASSES TEORÍA	Hours: 48h Theory classes: 8h Self study: 40h

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FINAL REVIEW OF RECOVERY COURSE	Hours: 1h Theory classes: 1h
<p>Description: There will be a test of 1h of duration in which the student must demonstrate that he has reached the level required to recover this subject. For this will be a written test that will be of shorter duration than the examination to which it recovers and of much more basic contents This basic test will only allow to pass the subject, that is to say, the maximum grade will be of 5. Only students who do not have the subject approved can be presented to this test.</p> <p>Support materials: The typical material of a written exam. Writing material, calculator and paper</p> <p>Descriptions of the assignments due and their relation to the assessment: The written test will be delivered on the same day and at the time of the test, corrected as soon as possible to have a reference note</p> <p>Specific objectives: With this test the student is given the last opportunity to reach the minimum requirements to pass the subject, which would be more basic than in the normal exam, but the maximum grade will also be simply passed (5) or suspended. It is not possible to obtain more note by means of this test than it has been indicated is of minimum contained.</p>	

Bibliography

Basic:

- Mujal Rosas, R.M. Protección de sistemas eléctricos de potencia [on line]. Barcelona: Iniciativa Digital Politécnica, 2014 [Consultation: 08/05/2018]. Available on: <<http://hdl.handle.net/2099.3/36676>>. ISBN 9788476539729.
- Mujal Rosas, R.M. Cálculo de líneas y redes eléctricas. Barcelona: Iniciativa Digital Politécnica, 2013. ISBN 9788476539866.
- Checa, Luis M^a. Líneas de transporte de energía. 3^a ed. Barcelona: Marcombo Boixareu, 1988. ISBN 8426706843.
- Stevenson, W.D.; Grainger, J. Análisis de sistemas eléctricos de potencia. 4^a ed. México: McGraw-Hill, 2004. ISBN 9788476534563.
- Porras, A.; Guerrero, A. Seguridad en las instalaciones eléctricas. Madrid: McGraw-Hill, 2000. ISBN 8448127374.