820145 - MXEQSEE - Condition Monitoring in Power Grids and Power Quality

**Coordinating unit:** 295 - EEBE - Barcelona East School of Engineering

**Teaching unit:** 709 - EE - Department of Electrical Engineering

**Academic year:** 2016

**Degree:**
- BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)

**ECTS credits:** 6  
**Teaching languages:** Catalan, Spanish

**Teaching staff**

**Coordinator:** ROBERTO VILLAFÁFILA ROBLES

**Others:** ROBERTO VILLAFÁFILA ROBLES - ANDREAS SUMPER

**Requirements**

Electric systems

**Degree competences to which the subject contributes**

**Specific:**
1. Apply regulations and standards based on sound criteria.
2. Carry out calculations for the design of power lines and electric power transmission systems.
3. Understand electrical power systems and their applications.

**Transversal:**
4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

**Teaching methodology**

Lectures 30%, laboratori 10% and self-study 60%.

**Learning objectives of the subject**

Knowledge of requirements regarding monitoring of power systems and the available tools for a proper exploitation, including operation (power quality) and maintenance (asset management).
Study load

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<thead>
<tr>
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<th>45h</th>
<th>90h</th>
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<tr>
<td>Total learning time:</td>
<td>150h</td>
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<td>Hours large group:</td>
<td></td>
<td></td>
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<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td></td>
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<td>Hours small group:</td>
<td>15h</td>
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<td>Guided activities:</td>
<td>0h</td>
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<tr>
<td>Self study:</td>
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<td>60.00%</td>
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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%)
## Content

### Introduction

**Learning time:** 12h  
Theory classes: 4h  
Self study : 8h

**Description:**  
Social, technical and economical context of monitoring of power systems and power quality.  
**Specific objectives:**  
Description of social, technical and economical context for monitoring of power systems and power quality.

### Monitoring of power systems

**Learning time:** 54h  
Theory classes: 16h  
Laboratory classes: 6h  
Self study : 32h

**Description:**  
Monitoring the operation of power systems.  
Components of power systems and their requirements regarding monitoring.  
Monitoring strategies for components and monitoring devices.  
**Specific objectives:**  
Knowledge of the objectives of monitoring the operation of power systems.  
Knowledge of components of power systems and their requirements regarding monitoring.  
Knowledge of monitoring strategies for components and monitoring devices.

### Power quality

**Learning time:** 84h  
Theory classes: 25h  
Laboratory classes: 9h  
Self study : 50h

**Description:**  
Power quality standards.  
Power quality disturbances: definition, causes and effects.  
Power quality solutions: appliances and equipment.  
**Specific objectives:**  
Knowledge of needs of a good power quality.  
Knowledge of origin of disturbances.  
Knowledge of power quality solutions: appliances and equipment.
Qualification system

The professors will evaluate the students. Final grade is calculated as following:
- Each of the partial exam per theme 30%
- Exercises and problems 15%
- Laboratory tutorials 15%
- General competence 10%

Bibliography

Basic:

