# Electric Power Systems I

**Lecturers**
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**Course mnemonic**
ELEC-H413

**ECTS credits**
5 credits

**Language(s) of instruction**
English

**Course period**
First term

## Course content

- Power system component modeling
- Load flow
- Power system state estimation
- Economics of electricity generation (economic dispatch, unit commitment)
- Optimal and secure operation of transmission systems
- Frequency control and stability

## Objectives (and/or specific learning outcomes)

Knowledge about the models, mathematical tools and algorithms used in the planning, the operation and the control of electrical power systems.

**At the end of this course, the students will be able to :**

- Establish a static model of a power system
- Implement a load flow algorithm, with different variants
- Implement a state estimation using a weighted least squares method
- Perform an economic dispatch and an unit commitment of the electricity generation
- Use an optimal power flow in various context
- Study the security level of a power system faced to contingencies

## Pre-requisits and co-requisits

### Courses having this one as pre-requisit

ELEC-H508 | Thermal power plants | 4 crédits and GEST-H506 | Energy policy and management | 5 crédits

## Teaching method and learning activities

Courses (30h)

Exercises (30h)

### References, bibliography and recommended reading

- A. S. DEBS, Modern power systems control and operation KLUWER Academic publishers 1988 - ISBN 0-89838-265-3 2)
- A. WOOD, B. WOLLENBERG, Power generation, operation and control WILEY 1996 - ISBN 0-471-58699-4

## Other information

### Contact(s)

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## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

Written exam on exercices

Oral exam on the theory

### Determination of the mark (including the weighting of partial marks)

50% Oral examination

50% Written examination

### Main language(s) of evaluation

English

## Programmes

### Programmes proposing this course at the Brussels School of Engineering

MA-IREM | Master of science in Electromechanical Engineering | finalité Professional/unit 1