

**ENERGIE ELECTRIQUE****ELECTRICAL ENERGY****Lecturers:** Arnaud BREARD, Christian VOLLAIRE

| Lecturers : 12.0 | TC : 14.0 | PW : 4.0 | Autonomy : 0.0 | Study : 2.0 | Project : 0.0 | Language : FR

Objectives

Introduce students to the basic concepts implemented in electrotechnical systems. Particular emphasis is placed on the energy aspect. Methods and tools for analysis and design of electrical systems allow the understanding of the functioning of electrical equipment used in the production, transportation and utilization of electrical energy. For each topic, the course begins with an overview of industrial applications of everyday life in which the production, transportation, processing or use of electrical energy comes. Technological aspects and the orders of magnitude are discussed. The set aim, in teaching terms, is the acquisition of a global comprehension of the energy conversion systems that an engineer will meet in his professional and personal

Keywords : Maxwell's equations and the various simplifications, Conduction currents, displacement currents, propagation ; Behaviour of variables at the interfaces ; EM properties of the materials ; Ampere theorem, flow conservation ; Some models of complex structures ; Power electronic.

Programme

- Kirchhoff network.
- Three phase systems.
- Low frequency electromagnetism.
- Induction - application to transformer.
- Static conversion of electrical energy.

Learning outcomes

- Acquire knowledge about the main functions present in the energy conversion systems.
- Acquire knowledge about techniques which are associated for the energy conversion systems.
- Acquire knowledge about orders of magnitude and the specific vocabulary.

Independent study

Objectifs : This activity is not concerned with framed autonomy activities outside personal work.

Méthodes : This activity is not concerned with framed autonomy activities outside personal work.

Core texts

F. de COULON et M. JUFFER, *INTRODUCTION À L'ÉLECTROTECHNIQUE, VOLUME 1*, EPFL DUNOD
A. FOUILLE *ELECTROTECHNIQUE À L'USAGE DES INGÉNIEURS*, DUNOD
M. BORNADE *ELECTROTECHNIQUE*, VUIBERT

Assessment

Theoretical note: Nth
Practical note: Ntp
Global note: $0.9 \cdot Nth + 0.1 \cdot Ntp$