

### Energy

#### Electrical Machines

#### IDENTIFICATION

CODE : GEN-4-S1-EC-MELE  
ECTS : 3.0

#### HOURS

Lectures : 16.0 h  
Seminars : 16.0 h  
Laboratory : 16.0 h  
Project : 0.0 h  
Teacher-student  
contact : 48.0 h  
Personal work : 10.0 h  
Total : 58.0 h

#### ASSESSMENT METHOD

1x2h

#### TEACHING AIDS

#### TEACHING LANGUAGE

French

#### CONTACT

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#### AIMS

Today, almost all engineers must deal with issues related to electrical machines in the fields of development, from construction to manufacturing. Electrical machines and controls occur on many work machines. The objective of this course is to give non-specialists a knowledge of Electrical and Power Electronics materials based on opportunities materials, the conditions of implementation, the choice between different solutions. This achievement should facilitate dialogue with specialists.

#### CONTENT

Single and three phase circuits. Single-phase transformer. 5 h.  
Operating regimes and an electromechanical system stability [transient and steady state.] 3 h.  
Studies of DC machines and AC [synchronous and asynchronous]  
- Principle, properties, power balance, reversible operation, modeling. 8 h.  
Study of static converters and application to the speed control:  
- Elements of comparison systems [performance, complexity, maintenance, cost ...] 2 h.  
This course is completed by 4 sessions of 4 hours of Practical Work concerning the machines implementation and speed variation.

#### BIBLIOGRAPHY

- Handout 5 fascicles [electrical networks, dc machine, synchronous and asynchronous, courses power electronic converter] - INSA Lyon
- "Electric variable speed" - Volume 1: motorvariators DC - Ed F. Bernot International Thomson Publishing
- "Electrical Machines" - J. Niard, R. Moreau, J. Battut Ed Nathan
- "Power Electronics" - Courses and solved exercises - Mr. Ed Lavabre - Casteilla-Educavivre

#### PRE-REQUISITE

General laws of electricity. Mathematics [complex number].

#### INSA LYON

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