EPFL

EE-490(c) | **Lab in electrical energy systems**

Hodder André

Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
TP	4 weekly
Number of positions	

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Summary

This teaching lab provides the theory and experimental experience associated to the advanced behavior of electrical machine such as the dq models, islanded induction machine generator, induction machine supplied by a frequency converter, synchronous machine 3 phase short circuit, ...

Content

The student will learn 3 different aspect through this lab

1. Simulations
The student will developped his own simulation tool to integrate the differential equations of the electrical machines. This will allow the student to understand the dq model of the induction and synchronous machines.

- Runge-Kutta
- RL Circuit
- Single phase transformer
- Three phase transformer
- Induction Machine (dq model)
- Synchronous Machine (dq model)

2. Advanced behaviour of electrical machines
2.1. Induction machine

- Determination of parameters
- Islanded generator
- Supply with a frequency converter

2.2. Synchronous Machine

- Determination of parameters
- 3 phase sudden short circuit

3. Transversal skill
The student will learn how to plan a test session, learn how to write a lab book and how to fend for himself

Keywords

- dq model of electrical machines
- advanced behavior of electrical machines and drives

Learning Prerequisites

Required courses

Courses on electrical machines

Learning Outcomes

By the end of the course, the student must be able to:

- Analyze
- Characterize
- Perform
- Exploit
- Manipulate
- Verify

Teaching methods

Practical works in groups

Expected student activities

Attend every teaching lab and participate actively.

Assessment methods

Obligatory continuous

Supervision

Assistants   Yes