

EE-466

Energy storage in power systems: technologies, applications and future needs

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Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.
Energy Science and Technology	MA1, MA3	Opt.
Energy minor	H	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Written
Workload	90h
Weeks	14
Hours	3 weekly
Lecture	2 weekly
Exercises	1 weekly
Number of positions	

Summary

The course will bring the major elements on energy storage, principles and physical means

Content

Fundamentals of energy storage, Ragone representation, energy density, power density.
 Electrochemical storage components
 Supercapacitors
 Hydraulic storage
 Flywheels
 Compressed air energy storage
 Transportation, mobile applications
 Power electronics and grid connected systems

Learning Prerequisites

Required courses

Energy conversion
 Power electronics

Learning Outcomes

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

- Understand the techniques of energy storage
- Design correctly a storage system regarding power demand, energy content, energy efficiency

Assessment methods

Written exam

Resources

Moodle Link

- <https://go.epfl.ch/EE-466>