

COURSE	Name : Electric Energy Storage Devices
	Code : EE185515
	Credit(s) : 3
	Semester : (Elective Course)

Description of Course

This course discusses various electrical energy storage devices and technologies, as well as the dynamics and modeling, standards, management, monitoring, sizing, placement, interfacing, and state-of-the-art.

Learning Outcomes**Knowledge**

(P02) Mastering engineering concepts and principles to develop the necessary procedures and strategies for systems analysis and design in the areas of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

Specific Skill

(KK02) Able to compose problem solving in engineering through depth and breadth of knowledge which adapts to changes in science and technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

General Skill

(KU04) Being able to identify the scientific field that becomes the object of his research and positions into a research map developed through interdisciplinary or multidisciplinary approach.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

Course Learning Outcomes**Knowledge**

Mastering the concepts and principles of engineering of electrical energy storage.

Specific Skill

Being able to formulate problems and solutions related to electrical energy storage.

General Skill

Being able to identify and be aware of his/her own research position in the electrical energy storage research field.

Attitude

Show the attitude of being responsible for the work in his/her area of expertise independently.

Main Subjects

1. Energy storage general overview
2. Rechargeable battery technologies
3. Dynamics and modeling of rechargeable batteries
4. Management of rechargeable batteries
5. Electric double-layer capacitors / supercapacitors

6. Hydrogen-based storages and fuel cells
7. Hybrid energy storage
8. Specific considerations for batteries and/or supercapacitors:
9. Energy storage-related standards
10. Various applications of energy storage
11. State-of-the-art of energy storage devices and technologies

Reference(s)

- [1] N. Kularatna, Energy Storage Devices for Electronics Systems: Rechargeable Batteries and Supercapacitors. Academic Press, 2014.
- [2] P. T. Moseley, Garche, J., Ed. Electrochemical Energy Storage for Renewable Sources and Grid Balancing. Elsevier, 2014.
- [3] V. C. Aiping Yu, Jiujun Zhang, Electrochemical Supercapacitors for Energy Storage and Delivery: Fundamentals and Applications. CRC Press, 2013

Prerequisite(s)

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