Course Code	Course Title	ECTS Credits
ENEM-370	Energy Storage and Management	6
Department	**Semester**	**Prerequisites**
Life and Health Sciences	TBA	None
Type of Course	**Field**	**Language of Instruction**
Major Requirement	Environmental and Energy Management	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	3rd	Dr Agapios Agapiou
Mode of Delivery	**Work Placement**	**Co-requisites**
face-to-face	N/A	None

Course Aim

The aims of this course are to enable students to learn about :

- Energy storage and management overview
- Thermodynamics
- Ionic battery
- Fuel cell / regenerative fuel cell
- Super-capacitor
- Reaction kinetics
- Charge and mass transport
- Electrochemical characterization

Learning Outcomes:

After a successful completion of this class, students are expected to:

1. Understand the necessity and usage of different energy storage schemes for different purposes
2. Understand the importance of the concept of energy management
3. Have a technological overview of various energy storage schemes
4. Understand the operational mechanisms of each energy storage system
5. Understand preliminary thermodynamics and electrochemistry
6. Be able to characterize and analyze electrochemical energy storages

Course Content:

This course is intended to provide students an overview on energy storage schemes/devices with major focus on electrochemical storages including ionic batteries, fuel cells and super-capacitors. The course will cover operating principles, physics behind them, characterization methods and advantages/issues of each scheme. Exposure to thermodynamics (enthalpy, entropy, Gibbs free energy, phase diagram, etc.) is recommended but not mandatory.

Teaching Methods:

PPT Lectures, Videos, Readings, In-class discussions

Assessment Methods

Assignments, mid-term exam, final exam

Required Textbooks:

Authors	Title	Publisher	Year	ISBN
Huggins R. A.	*Energy Storage*	Springer	2010	
O'Hayre R., et al.	*Fuel Cell Fundamentals (2nd Edition)*	Wiley	2009	