Module Layout
ΧΜΠ611: Energy Production and Storage

Faculty	*Code*	*Faculty of Pure and Applied Sciences*		
Programme of Study	*ΧΜΠ*	*Sustainable Environmental Engineering*		
Module	*ΧΜΠ611*	*Energy Production and Storage*		
Level of Study	**Undergraduate**	**Graduate**		
		Master	**Doctoral**	
		X		
Language of Instruction	Greek			
Mode of Delivery	Distance			
Module Type	**Required**	**Electives**		
	X			
Number of Group Consulting Meetings	***Total***	***Physical Presence***	***Online***	
	13	**0**	**13**	
Number of Assignments	**1**			
Final Grade Calculation	**Assignments**	**Weekly Activities**	**Final Exam**	
	30 **%**	*10* **%**	*60* **%**	
Number of European Credit Transfer System (ECTS)	*10*			

Module Description

The Thematic Unit aims to lay the scientific foundations and provide the tools for the preparation and characterization of new materials. Reference will be made to the structure of materials and their resulting technological importance. The use of these materials for energy production and storage will be reported. The necessary definitions and terminology will be given for the smooth running of the course. A general reference will be made to the properties of the materials. Definitions of properties such as electrical conductivity, an understanding of how microstructure influences the thermal conductivity of materials and their resistance to electrochemical stress and thermal shock will be given.

A detailed reference will also be made to the electrical properties of the materials. Definitions will be given and phenomena related to structure and electrical conductivity will be explained (Ohm's Law, conductors and semiconductors, insulators and dielectric properties). Reference will be made to the mechanical properties of materials. Definitions will be given and phenomena of mechanical behavior at macroscales and at small length scales will be explained. A report will be made to various types of materials such as metallic materials, ceramics and glasses, polymers and composites, electronic, magnetic and photonic materials. Also, the application fields of each material will be discussed. A report will be made to materials for green forms of energy production as well as materials for sustainable development. Reference will be made to the corrosion and wear of the materials which ultimately determine the duration of their application. For the innovative integration of materials in a safe way in a design structure it is necessary to know the properties and functionality of the materials through the control of their structure and their processing techniques. For this reason, criteria will be documented for the selection of materials for innovative applications with an emphasis on environmental chemical engineering and the requirements arising from it..

Pre-requisite Modules

Not applicable

Co-requisite Modules

Not applicable	

Grading Scheme			
Assessment Method	***Percentage on Final Grade***	***Workload***	
		Hours	***ECTS***
Weekly Study *13 weeks * ~11 study hours*		*140-160*	*4.5*
Weekly Interactive Activities *13 weeks * ~1 hour of work*	*10%*	*~13*	*0.5*
Assignment	*30 %*	*80 - 100*	*5.0*
Final/Repeat Examination	*60 %*	*3*	*--*
Total	**100%**	*250-300*	*10*

Grading Rules and Assessment methods

- Students are evaluated with 10, if they earn 100% of the possible grade.
- Students are evaluated with 9, if they earn 90% of the possible grade, I.e. 90%*10=9, etc.
- Passing rate
  - 50% of the Assignment
  - 50% of the Interactive Activities
  - Students are allowed to participate in the final exam of a Module if they have overall earned the minimum grade (≥ 50 %) in both their Assignment and Interactive Activities
  - 50% of the Final exam

If a student earns a grade with decimal points, then it is rounded to the nearest half unit.