NANOMATERIALS FOR ENERGY

COURSE OUTLINE

Responsible: Georgios Kakavelakis

1. GENERAL			
SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Electronic Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	8000.1.253.0	**SEMESTER**	Winter/Spring
COURSE TITLE	Nanomaterials for Energy		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course	**WEEKLY TEACHING HOURS**	**CREDITS**
	3	5
Total	**3**	**5**

COURSE TYPE general background, special background, specialised general knowledge, skills development	Erasmus
PREREQUISITE COURSES	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS	English
OFFERED TO ERASMUS STUDENTS	Yes (in English) — Both Winter and Spring Semesters
COURSE WEBSITE (URL)	https://eclass.hmu.gr/courses/EE399/

2. LEARNING OUTCOMES

Learning outcomes

Understands the basic Nanoscale and Nanomaterials

Understands the basic principles of quantum confinements

Understands the basic principles of structural characterization of nanomaterials

Understands the basic principles of morphological characterization of nanostructures

Understands the basic principles of metal oxides nanoparticles, quantum dots and plasmonic metal nanoparticles

Understands the basic principles of nanomaterials applications in energy devices such as solar cells, batteries, electrochemical cells, etc

General Competences

Search, analysis, and synthesis of data and information, using the necessary technologies

Independent and teamwork

Adaptation to new situations

Decision-making

Generation of new research ideas

3. SYLLABUS

Introduction to Nanotechnology and Nanomaterials

Introduction to Metal Oxide Nanoparticles

Introduction to Plasmonic Metal Nanoparticles

Introduction to Quantum Dots

Introduction to optical, electrical, surface and morphological characteriazation techniques for nanomaterials

Introduction to Energy Devices incorporating nanomaterials

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face-to-face theoretical teaching Asynchronous e-learning
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Educational software packages for measurement collection and analysis Support for the learning process through the e-class electronic platform
TEACHING METHODS The manner and methods of teaching are described in detail.	

Activity	**Semester workload**
Lectures and discussions	39
Tutorial (examples, application exercises)	30
Project Presentation	39
Non-guided (independent) study	39
Exams	3
Course total	**150**

STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure	Assessment Language: English Multiple/Combined assessment methods: Mid Term Exam: 30% of the final grade Project Presentation: 40% of the final grade Final written examination: 30% of the final grade (60% of the final grade if there is no mid-term exam)

5. ATTACHED BIBLIOGRAPHY

Course transparencies

Academic literature