

COURSE OUTLINE

(1) OVERVIEW

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL	Undergraduate		
COURSE CODE	8.003	SEMESTER	8 th
COURSE NAME	Electricity Economy		
COURSEWORK BREAKDOWN		WEEKLY TEACHING HOURS	ECTS Credits
Lectures and exercises		3	3
Laboratory/Workshops		1	1
TOTAL		4	4
COURSE UNIT TYPE	Knowledge deepening / Special Background		
PREREQUISITES	-		
LANGUAGE OF INSTRUCTION/EXAMS	GREEK		
COURSE DELIVERED TO ERASMUS STUDENTS	NO		
WEB PAGE (URL)	https://eclass.hmu.gr/courses/ECE172/		

(2) LEARNING OUTCOMES

Learning outcomes
<p>The peculiarities of electricity as a good in its management form a particularly interesting field of deepening the knowledge on power Systems of an Electrical and Computer Engineer. The generation and distribution of electricity, especially after deregulation, is characterized by ideas and calculations in which a modern electrical and Computer Engineer will have to delve deeper. Upon successful completion of the course students will be able to:</p> <p>A) Distinguish energy consumption components and specify statistics on electricity generation and consumption.</p> <p>B) Recognize the key power generation technologies, with particular emphasis on their economic characteristics.</p> <p>C) Identify and estimate the components of the cost of electricity supply, defining sizes such as the fuel consumption curve.</p> <p>D) Identify the objectives and the procedure of the operation planning of a Power system in both short and long term periods.</p> <p>E) They can carry out an investment assessment evaluation for the energy sector.</p> <p>F) They will be able to evaluate reliability indicators for Power Generation Systems for the best possible generation mix.</p>
General competence
<p>The course aims to acquire, by the graduate, the following general skills:</p> <ul style="list-style-type: none"> • Search, analysis, and synthesis of data and information, using the necessary technologies • Adaptation to new situations • Working independently • Team work • Working in an interdisciplinary environment • Exercise of criticism and self-criticism • Project planning and management • Promotion of free, creative and inductive thinking

- Working in an international environment
- Decision-Making

(3) SYLLABUS

The aim of this course is to provide the necessary skills for the understanding of the operating environment of energy systems, the analysis of energy data, the economic operation of a power system as well as the evaluation of investment projects in the field of energy. In this way, students will delve into the concepts of previous semesters by combining them to propose methods of economic operation and will have the special knowledge to specialize in very specific topics in the next semester.

Theory

1. Analysis of electricity demand and energy balances
2. Basic Elements Of A Power Generation System
3. Economic operation of electricity generating systems (integration of units, economic scheduling functions)
4. Investment evaluation. Analysis of the cost of electricity supply using probabilistic methods
5. Reliability analysis of the production system (rate of unplanned interruptions)

Laboratory/Workshops

- A) Energy data analysis and indices calculations
- B) Declaration of techno-economic data of Generation Units
- C) Functions of economic analysis of investments

(4) TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	Face to face in the classroom	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Use of ICT in teaching Use of ICT in laboratory training Use of ICT in communicating with students through the electronic platform e-class	
TEACHING ORGANIZATION	Method description/Activity	Semester Workload
	Lectures	35
	Workshops	13
	Laboratory demonstrations	9
	Study (project)	17
	Written Assignments	12
	Independent study	34
	Total Contact Hours	120
ASSESSMENT METHODS	Examination language: Greek Evaluation methods: <ol style="list-style-type: none"> 1. Written final exam (75%) <ul style="list-style-type: none"> • with problem solving • with targeted multiple choice questions • Short Answer Questions 2. Laboratory Reports (15%) 	

	<p>3. Written exercises during the semester (10%)</p> <p>The evaluation criteria are announced to the students at the beginning of the semester and are posted on the Eclass course website.</p>
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(5) RECOMMENDED BIBLIOGRAPHY

- Suggested Bibliography:

1. *Economic operation of electricity systems (1998)*, Authors: Mpakirtzis Anastasios G. Diathetis (Author): Zhth Pelagia & Co. (in Greek)
2. Saadat, H. (1999). *Power system analysis, McGraw Hill Companies*

Scientific Journals:

1. *IEEE Power and Energy Magazine*
2. *Energy Policy*
3. *Utilities, Elsevier*

Links:

1. *Electricity Market Operator –www.lagie.gr*
2. *Independent Electricity Transmission Network Operator (IPTO)-Www.admie.gr*
3. *Eurelectric.eu*
4. *HEDNO-www.deddie.gr*
5. *International Council on Large Electric Systems(CIGRE) Reference Papers of <https://www.cigre.org/GB/publications/reference-papers>*