EEE.7-1.1 Electrical Power Systems I

COURSE OUTLINE

1 GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Electronics Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	EEE.7-1.1	**SEMESTER**	7
COURSE TITLE	Electrical Power Systems I		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	4
Laboratory	0	
Total	3	

COURSE TYPE:	Specialization Course
PREREQUISITE COURSES:	Introduction to Electrical Power Systems
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (official)
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	www.eee.uniwa.gr

2 LEARNING OUTCOMES

Learning outcomes

The objectives of the course are to:
familiarize the student with electrical power systems and especially the study and mathematical analysis of electric networks during transient periods regarding the electric power transmission from various power generation stations to consumer areas as well as final individual consumers so as to enable him/her that to know and understand the related procedures from technical, economic and social point of view during training as an electrical engineer.
enable the student to understand all the necessary information concerning any procedure section of designing and functioning of electric power systems and thereafter work sufficiently in related positions.

General Competences

The course aims at developing the following abilities:

1. Search for, analysis and synthesis of data and information, with the use of the necessary technology
2. Adapting to new situations
3. Decision-making
4. Working independently
5. Team work
6. Criticism and self-criticism

3 COURSE CONTENT

A. THEORY

1. Symmetrical and asymmetrical faults. Short-circuit current and short-circuit power.
2. Transient models of synchronous generators. Transient models of asynchronous motors. Transient and sub-transient impedances and time constants. Generator short circuit under load. Generator short circuit connected to a power electronics circuit.
3. Analytic and digital three phase studies of short circuits. Equivalent system resistance. Asymmetrical three phase systems.
4. Symmetrical components and sequence networks. Sequence network impedances of generators and transformers.
5. Asymmetrical faults. Multiple network faults. Earth effects. Asymmetrical transformer charging. Analysis of transmission line impedances. Asymmetries of three phase transmission lines. Clarke components and other transformations.
6. Operation problems of connected systems during transient period.

4 TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	In the classroom with the physical presence of students
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of I.C.T. for communication with students
TEACHING METHODS	

Activity Semester workload	***Activity Semester workload***
Lectures	39
Study	39
Exercises	26
Tutorial/Interactive teaching	16
Course total	120

STUDENT PERFORMANCE EVALUATION	Final written exam of theoretical part includes (100% of the total score): a. Solving theoretical problems relating to the subject of the course b. Description / evidence theory data c. Interim written assessments during the semester d. Individual technical reports e. Group technical reports

5 ATTACHED BIBLIOGRAPHY

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22. «Computer modelling of electrical power systems», J. Arrilaga et al, John Wiley,1983.
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