

## EEE.9-1.6 Electrical Power Systems Protection

### COURSE OUTLINE

#### 1 GENERAL

<b>SCHOOL</b>	Engineering		
<b>DEPARTMENT</b>	Electrical and Electronics Engineering		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	EEE.9-1.6	<b>SEMESTER</b>	9
<b>COURSE TITLE</b>	Electrical Power Systems Protection		
<b>INDEPENDENT TEACHING ACTIVITIES</b>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
<b>Lectures</b>		3	4
<b>Laboratory</b>		0	
<b>Total</b>		3	
<b>COURSE TYPE:</b>	Specialization Course		
<b>PREREQUISITE COURSES:</b>	No		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek (official)		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	No		
<b>COURSE WEBSITE (URL)</b>	<a href="http://www.eee.uniwa.gr">www.eee.uniwa.gr</a>		

#### 2 LEARNING OUTCOMES

<b>Learning outcomes</b>
<p>The course aims at familiarizing the student with the protection methods and equipment of electrical energy systems and their different building parts in order to be able to know the way of manufacturing and operating protective devices.</p> <p>The objectives of the course for the student are:</p> <ol style="list-style-type: none"> <li>1. To be informed of the malfunctions of electrical energy systems and the estimation of the respective protection needs,</li> <li>2. To describe analytically the protection devices of all electric networks parts from the construction and operation point of view,</li> <li>3. To understand the need for continuous readiness and effectiveness, preventive maintenance of protective devices on a technical, economic and social basis.</li> </ol>
<b>General Competences</b>
<p>The course aims at developing the following abilities:</p> <ol style="list-style-type: none"> <li>1. Search for, analysis and synthesis of data and information, with the use of the necessary technology</li> <li>2. Adapting to new situations</li> <li>3. Decision-making</li> <li>4. Working independently</li> <li>5. Team work</li> <li>6. Criticism and self-criticism</li> </ol>

### 3 COURSE CONTENT

#### A. THEORY:

1. Operation principles and the role of protection devices.
2. Types and operation of relays.
3. Protection of high voltage electric transmission lines.
4. Protection of electric machines.
5. Protection of transformers.
6. Protection devices of power plants, substations and electrical installations.
7. Economic analysis of protection devices.

### 4 TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b>	In the classroom with the physical presence of students	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	Use of I.C.T. for communication with students	
<b>TEACHING METHODS</b>	<b>Activity Semester workload</b>	<b>Activity Semester workload</b>
	Lectures	39
	Study	39
	Exercises	26
	Tutorial/Interactive teaching	16
	Course total	120
<b>STUDENT PERFORMANCE EVALUATION</b>	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

1. Κ. Κριτωπάκης: «Προστασία των ηλεκτρικών εγκαταστάσεων», Εκδόσεις Τζιόλα, 2012.
2. Μ.Π. Παπαδόπουλος: «Προστασία συστημάτων ηλεκτρικής ενέργειας», Εκδόσεις ΕΜΠ, 1997.
3. Weedy B., «Electric Power Systems», John Wiley and Sons, 2002
4. Ν. Βοβού, «Προστασία συστημάτων ηλεκτρικής ενέργειας», Εκδόσεις Ζήτη, 2006
5. Cotton H., Barber H., «The Transmission and Distribution of Electrical Energy», 1970
6. Lewis W., «The Protection of Transmission Systems against Lightning», Wiley, 2002
7. P.M. Anderson, «Power system protection», IEEE Press-Wiley Interscience, 1999.