

## MODULE DESCRIPTOR

<b>MODULE TITLE</b>	POWER SYSTEMS		
<b>MODULE CODE</b>	EL2801 (L5)	<b>CREDIT VALUE</b>	20 CREDITS (10 ECTS)
<b>CAMPUS</b>	UCLAN CYPRUS		
<b>SCHOOL</b>	SCHOOL OF SCIENCE		

### MODULE AIMS

The aim of this module is to enhance students knowledge of fundamental topics in the field of Power Systems Engineering.

### MODULE CONTENT

AC Single phase and Three phase electrical circuits: Phase diagrams, Star and Delta connections, Power (Active, Reactive) and power measurement  
Magnetic circuits and operation of single and three phase Transformers. Operation of permanent magnet.

DC machines: Construction, torque equation, MMF and EMF, open circuit characteristics and load characteristics, of DC motors, Load characteristics of generators. Parallel and series operation, Control of DC motors.

AC rotating machines: Synchronous machine, Construction, synchronous impedance, regulation. Motor and generator load diagrams. Induction Generators.

Polyphase induction motor: Construction and mode of operation. Torque and mechanical power output, torque characteristics.

Basic of Electrical Energy transmission. Operation and Control of electrical Energy transmission systems. Symmetrical faults, symmetrical components and sequence networks for generators, transformers, transmission lines and loads, analysis of unsymmetrical faults (single line to earth, line to line, double line to earth, open conductor faults), basic system protection concepts.

High and Low voltage electric equipment and apparatuses. High voltage substations, low voltage switching equipment.

### INTENDED LEARNING OUTCOMES

On successful completion of this module a student will be able to:	
1.	Evaluate key concepts on magnetic circuits and single and three phase transformers.
2.	Develop appropriate solutions to defined problems in the field of Electrical machines.
3.	Evaluate and propose problem-solving strategies to solve problems related to the transmission of electrical energy through transmission lines.
4.	Use high and low voltage equipment and identify appropriate solutions for problems related to high voltage substations and low voltage switching equipment.

## TEACHING METHODS

The class contact will consist of lectures, tutorials, and practical sessions. Lectures will introduce new material and provide examples. During the tutorials, students will apply lecture theory to solve related problems. Practical session will be used to familiarise students with laboratory equipment and develop their practical skills. Whenever possible guest lecturers (industry experts and/or researchers) will be invited to provide specific seminars within their expertise so as they can demonstrate to the students' real life applications of the relevant theory.

The module will be assessed by three short tests and a number of practical assignments (laboratory work). To assess how well students understand all the topics covered in the module, given the benefit of the feedback from the short test and practical assignments, a final exam will be used.

## ASSESSMENT METHODS

The module is assessed through Practical assignments over several weeks (Laboratory work) and a final written exam.