

Course unit title:	Basic Power System Protection		
Course unit code:	AEEE454		
Type of course unit:	Technical Elective		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	4		
Semester when the unit is delivered:	7-8 (Fall/Spring)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Alexis Polycarpou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Describe what is switchgear, isolators, circuit breakers. Explain circuit breaker operation. 2. describe operating characteristics, explain the principle of protecting radial feeder circuits with fuses 3. Analyse the operation of the various types of oil, air, sf6, vacuum circuit breakers, and explain their construction electrical principles. 4. Describe unit and non-unit protection, Analyse characteristics of zones of protection. 5. Explain primary and secondary protection schemes, describe dual main protection schemes. 		
Mode of delivery:	Face-to-face		
Prerequisites:	AEEE351	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> • Introduction to switchgear: general operational characteristics of circuit breakers, isolators, fuses, arc principles, contact erosion. • The fuse: operating characteristics of a fuse, rupture time, energy let through, use of fuses for protection of radial feeders. • Types of circuit breaker: oil, air, vacuum, sf6. Construction of various types, operational limitations of each model. • The protection overlay: unit protection, current differential scheme, non-unit protection, zones of operation of protection device, relay parameter setting. • Backup protection: primary and secondary protection, dual/main protection schemes. Relay Plug Multiplier setting calculations. 		
Recommended and/or required reading:	Notes provided by the lecturer.		
Textbooks:	Power system protection, P.M. Anderson , Mc Graw, Hill,1999.		
References:	<ul style="list-style-type: none"> • Power system protection , IEEE press series on Power engineering, 1999, Paul, M. Anderson, IEEE, ISBN: 0-7803-3427-2. • Practical power system protection, ISBN: 0750663979, by Leslie Hewitson, PSP Training, South Africa Mark Brown, Senior Staff Engineer, IDC Technologies, Perth, Australia. Ramesh Balakrishnan, Ramesh and Associates, Perth, Australia. 		
Planned learning activities and teaching methods:	Students are taught the course through lectures (3 hours per week) in classrooms or lectures theatres, by means of traditional tools or using computer demonstration. Auditory exercises, where examples regarding matter represented at the lectures, are solved and further, questions related to particular open-ended topic issues are compiled by the students and answered, during the lecture or assigned as		

	<p>homework.</p> <p>Topic notes are compiled by students, during the lecture which serve to cover the main issues under consideration. Students are also advised to use the subject's textbook or reference books for further reading and practice in solving related exercises. Tutorial problems are also submitted as homework and these are solved during lectures or privately during lecturer's office hours.</p> <p>Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constraints and revision timetable. The final assessment of the students is formative and is assured to comply with the subject's expected learning outcomes and the quality of the course.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> • Tests: 40% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No