UNIVERSITÀ DI PAVIA

Anno Accademico 2017/2018

ELECTRICAL POWER SYSTEMS B

Enrollment year	2017/2018
Academic year	2017/2018
Regulations	DM270
Academic discipline	ING-IND/33 (ELECTRICAL ENERGY SYSTEMS)
Department	DEPARTMENT OF ELECTRICAL,COMPUTER AND BIOMEDICAL ENGINEERING
Course	ELECTRICAL ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	2nd semester (05/03/2018 - 15/06/2018)
ECTS	6
Lesson hours	52 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	MONTAGNA MARIO (titolare) - 6 ECTS
Prerequisites	Basic knowledge of electrical plants and electrical machines.
Learning outcomes	Learning the basic techniques for the analysis and design of electrical distribution systems and users with particular reference to the following topics: calculation of short circuit currents, overcurrents and overvoltages following faults, calculation methods for networks of medium to large size.
Course contents	1. Review of basic electrical engineering concepts Electrical circuits in sinusoidal steady state conditions. Three-phase systems and method of symmetrical components. Theorems on electrical networks. 2. Generalities on electrical plants Classification and structure of the electrical systems. Generating plants; networks of high voltage transmission, the primary distribution, medium

	and low voltage distribution; civilian and industrial plants. 3. Components of the electrical systems Models of the most important components of an electrical plant. Transmission lines; calculation of the fundamental constants. Single-phase and three-phase transformers; method of relative values (per-unit); sequence impedances; models used for the calculation of short circuit currents. Synchronous machine model; synchronous impedances and sequence impedances. Basic characteristics of the induction motor model. Switching and protection. 4. Calculation of short-circuit currents Calculation of the symmetrical three-phase short circuit currents Study of three-phase systems with the method of symmetrical components; sequence networks. Calculation of unsymmetric short circuit currents. Neutral state in three-phase systems; short circuit currents and surges; fault protection with and without ground. 5. General equations of networks in continuous operation Using the general equations of the networks for the calculations of short circuit and distribution of power flows. Calculation methods suited to the implementation on a computer.
Teaching methods	Lectures and practical classes.
Reccomended or required readings	G. Granelli. Dispense di Impianti Elettrici B. G. Granelli, M. Montagna. Fondamenti di Impianti Elettrici, Vol. I. Cisalpino - Monduzzi Editoriale, Milano, 2013. N. Faletti, P. Chizzolini. Trasmissione e distribuzione dell'energia elettrica, 2 volumi. F. Iliceto. Impianti Elettrici, Volume I. Pàtron Editore, Bologna. V. Medved, R. Schinco. Le correnti di corto circuito negli impianti elettrici AT, MT e BT. Editoriale Delfino, Milano. Manuale Cremonese di Elettrotecnica, Vol. III. Edizioni Cremonese, Firenze. Comitato Elettrotecnico Italiano. Norme CEI 11-1, 64-8 , 11-25.
Assessment methods	The final examination consists of a written test and an oral examination (possibly held in written form).
Further information	The final examination consists of a written test and an oral examination (possibly held in written form).
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile