



INTRODUCTION TO POWER SYSTEMS

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-IND/33 (ELECTRICAL ENERGY SYSTEMS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	INDUSTRIAL ENGINEERING
Curriculum	Meccanica
Year of study	2°
Period	2nd semester (07/03/2022 - 17/06/2022)
ECTS	6
Lesson hours	50 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	BOVO CRISTIAN - 6 ECTS
Prerequisites	Basic knowledge of circuit theory.
Learning outcomes	<p>The course aims at providing the basic elements of plants and electrical machines in industry and power systems.</p> <p>Electrical plants: learning the basic techniques for the analysis and design of electrical distribution systems and load centers, with particular reference to the following topics: sizing overhead and cable lines both in medium and low voltage systems; protection circuits against overload and short circuit.</p>
Course contents	<ul style="list-style-type: none">- Medium and low voltage distribution systems; network structure; electric calculation of lines; approximate formulas of voltage drop for short lines; design and verification calculation with the criterion of the maximum admissible voltage drop.- Thermal phenomena in electrical lines; equations of heat transmission;

	<p>rated current flow for bare conductors; rated current flow for insulated conductors (electric cables); design of lines according to the thermal criterion; classification and structure of electric cables; cable rated flow for low voltage with air laying or buried installation according to the CEI-UNEL standards; operation of overloaded and short-circuited lines.</p> <ul style="list-style-type: none"> - Operating devices; classification and definitions; interruption of current flows; characteristics of circuit breakers, disconnectors and contactors, circuit breakers and differential circuit breakers. - Protection of low voltage circuits; overcurrent protection; thermal relays; electromagnetic relay; magneto-thermal protection. Fuses. Protection of lines against overloads and short circuits.
Teaching methods	Lectures (two thirds) and numerical exercises (one third).
Reccomended or required readings	<p>The lectures of the course and numerous numerical exercises with solutions are made available by the teacher through the Kiro platform.</p> <p>G. P. Granelli. Dispensing of electrical systems.</p> <p>G.P. Granelli, M. Montagna. Foundations of Electrical Installations vol. I. Cisalpino - Istituto Editoriale Universitario.</p> <p>Italian Electrotechnical Committee. CEI 64-8 and CEI-UNEL standards.</p>
Assessment methods	Written examination consisting of the numerical and motivated resolution of one or more exercises and answers to some questions.
Further information	==
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile