UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

ELECTRICAL ENGINEERING

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-IND/31 (ELECTROTECHNICS)
Department	DEPARTMENT OF ELECTRICAL,COMPUTER AND BIOMEDICAL ENGINEERING
Course	INDUSTRIAL ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	9
Lesson hours	75 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	MOGNASCHI MARIA EVELINA (titolare) - 3 ECTS SAVINI ANTONIO - 6 ECTS
Prerequisites	Lecturer: Antonio Savini Course name: Electrical Engineering Course code: 500547 Degree course: Ingegneria Industriale Disciplinary field of science: ING-IND/31 L'insegnamento è caratterizzante per: Ingegneria Industriale University credits: ECTS 9 Course website: n.d. Specific course objectives Knowledge of electrical quantities and units involved in the study of circuits; knowledge of linear one-port systems and their energy properties; knowledge of circuit laws and their numerical implementation;

	ability to solve simple circuit problems in DC, low and high frequency, in resonance or transient conditions. Course programme DC circuits Basic electrical quantities. One-port systems and their voltage-current characteristic. Ohm's law. Power balance. Electric circuits. Nodes and loops. Kirchhoff's laws. Linear circuit analysis. Circuit theorems. AC circuits Capacitor. Inductor. Signals in the time-domain and their representation. Circuit analysis in the frequency domain. Phasors. Impedance and admittance. Real, imaginary and complex power. Frequency response of a passive one-port system. Resonance. Two-port systems. Circuit analysis in the time-domain Analysis of a linear circuit of the n-th order. Natural frequencies, initial values, transient state and steady-state. Linear circuits of the first order. Linear circuits of the second order. Course entry requirements Linear algebra, complex numbers, derivatives and integrals.
Learning outcomes	Knowledge of electrical quantities and units involved in the study of circuits; knowledge of linear one-port systems and their energy properties; knowledge of circuit laws and their numerical implementation; ability to solve simple circuit problems in DC, low and high frequency, in resonance or transient conditions.
Course contents	DC circuits Basic electrical quantities. One-port systems and their voltage-current characteristic. Ohm's law. Power balance. Electric circuits. Nodes and loops. Kirchhoff's laws. Linear circuit analysis. Circuit theorems. AC circuits Capacitor. Inductor. Signals in the time-domain and their representation. Circuit analysis in the frequency domain. Phasors. Impedance and admittance. Real, imaginary and complex power. Frequency response of a passive one-port system. Resonance. Two-port systems. Circuit analysis in the time-domain Analysis of a linear circuit of the n-th order. Natural frequencies, initial values, transient state and steady-state. Linear circuits of the first order. Linear circuits of the second order.
Teaching methods	Lectures (hours/year in lecture theatre): 68 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0
Reccomended or required readings	C.A. Desoer, E.S. Kuh. Fondamenti di teoria dei circuiti. Franco Angeli, Milano. A. Savini. Argomenti di elettrotecnica con esercizi. Ed. Spiegel, Milano.

Assessment methods	The final examination consists of a written test and an interview.
Further information	The final examination consists of a written test and an interview.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile