Circuit theory

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Code:** N5AE04B
- **Open to exchange students:** No

Presentation

Objectives

Become familiar with the concept of linear electrical networks and their natural resonance frequencies. Understand multipole descriptions and master the use of quadripoles. Understand conventional methods of linear network analysis. Master the concept of transfer functions and their derivation in the case of a network with one input and one output. Master the technique of decomposition into simple elements in the case of steady-state sinusoidal conditions. Become familiar with the fundamental theorems in linear circuits.

Description

1) Methods for analyzing time-invariant linear circuits: Node potential analysis – Mesh current analysis – Time domain and solving linear equation systems in p – Steady-state sinusoidal domain and solving linear equation systems in jw

2) Transfer function: characteristic equation - zeros and poles – Analysis in arbitrary time domain – Analysis in steady-state sinusoidal domain – Simple elements in steady-state sinusoidal domain – Bode diagram

3) Fundamental theorems: superposition – Substitution - Thévenin/Norton - Reciprocity – Kennelly –Tellegen –Duality

Non-contractual information.
Last update on 30 October 2025

4) Quadripole: Characteristic matrices – Load line – Generator line – Classification and characteristics of quadripoles - Quadripole combinations

Non-contractual information.
Last update on 30 October 2025