

# Single-phase systems



## Component

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

## In brief

- > **Ametys Code:** N5AE03C
- > **Open to exchange students:** No

## Presentation

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### Objectives

Provide students with a scientific background enabling them to understand the concepts of:

- single-phase sinusoidal power supply
- single-phase harmonic pollution;

### Description

1- ELECTRICAL POWER IN SINGLE-PHASE SINUSOIDAL OPERATION

1-1. Sinusoidal alternating quantities

1-2. Complex impedances

1-3. Power in single-phase sinusoidal operation

1-4. Power factor correction

## 2- ELECTRICAL POWER IN NON-SINUSOIDAL OPERATION

2-1. Problems caused by distorting loads: harmonic pollution

2-2. Harmonic analysis of periodic signals

2-3. Power in non-sinusoidal operation

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## Pre-requisites

node laws/mesh laws;

- concept of impedance; generalized Ohm's law;
- elementary passive dipoles;

Mathematical prerequisites:

- vector construction;
- complex notation of a sinusoidal quantity;
- calculation of an effective value;
- use of Fourier series expansion.