

# Electromagnetic radiation and antennas



## Component

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

## In brief

- > **Amety's Code:** N8EE26A
- > **Open to exchange students:** Yes

## Presentation

### Objectives

Understand the physical origin of electromagnetic radiation – Know how to calculate and physically interpret the electromagnetic field radiated by a harmonic electrical current distribution

- Understand, know how to calculate and know how to manipulate the fundamental descriptors of antennas
- Understand the fundamental properties of wire antennas
- Know how to formulate and physically interpret link balances involving a transmitting antenna and a receiving antenna

### Description

I- Electromagnetic field radiated by a harmonic electrical current distribution

II- Power radiated by a harmonic electrical current distribution

III- Concept of electromagnetic radiation intensity

IV- Fundamental descriptors of antennas

IV-1- Directivity (radiation pattern, main lobe, blind directions, 3dB opening angle, side lobe level, E and H planes)

IV-2- Input impedance

IV-3- Efficiency

- IV-4- Gain
  - IV-5- Polarisation
  - IV-6- Effective area
  - IV-7- Bandwidth
  - IV-8- Phase centre
  - V- Link budget (FRIIS equation)
  - VI- Prospects in the field of antennas and related technologies
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## Pre-requisites

The subject 'Guided and free space propagation' (Apogée code N7EE09A1)