

Electromagnetism and multiscale devices



Component
École Nationale
Supérieure
d'Électrotechnique
d'Électronique

In brief

- > **Amety's Code:** N9EE14B
- > **Open to exchange students:** Yes

Presentation

Objectives

Understand the fundamental electromagnetic descriptors of multiscale structures - Know how to calculate and physically interpret the electromagnetic field in manufactured multiscale devices - Know how to calculate and physically interpret the electromagnetic field backscattered by natural multiscale structures

Description

- I- Length standard in electromagnetism
- II- Electromagnetic analysis of multiscale structures
 - II-1 Limitations of conventional numerical methods for electromagnetic analysis of multiscale structures
 - II-2 Iterative approaches for electromagnetic analysis of multiscale structures
 - II-3 Fundamental electromagnetic descriptors of multi-scale structures
- III- Application to the design of electromagnetic devices
 - III-1 Multi-band antennas
 - III-2 Miniature antennas
 - III-3 Multi-frequency selective surfaces
 - III-4 Selective microwave filters
 - III-5 Multi-band electromagnetic mirrors
 - III-6 Electromagnetic lattices

IV- Application to the analysis of electromagnetic diffraction from natural structures

IV-1 Back scattering from rough surfaces

IV-2 Back scattering from the sea surface

IV-3 Back scattering from vegetation cover

IV-4 Backscattering from porous rocks

VI- Technological prospects in the field of multi-scale device design and manufacture Multi-scale

Pre-requisites

The following subjects: Electromagnetic Diffraction Analysis (Apogee code N9EE14C) - Electromagnetic Radiation and Antennas (Apogee code N8EE26A) - Physical Analysis of Guiding Structures (Apogee code N8EE07E)