Master Nanosciences et nanotechnologies

Principles of optical and electronic spectrocopies, applications

Responsable

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Descriptions

Code : S58PH2NDQ5BIS

Nature :

Domaines : Sciences et Technologies

Informations

Composante : Faculté des Sciences

Nombre de crédits :

LANGUE(S) D'ENSEIGNEMENT

Anglais

CONTENU

Interaction with radiation and spectroscopic methods are privileged means of gaining access to the knowledge of matter. In this course, the fundamentals of optical and electron spectroscopies are discussed from both classical and quantum physical perspectives. The interaction mechanisms of radiation in the broadest sense (electromagnetic waves, electrons, neutrons, etc.) with matter, the processes of absorption, excitation and decay, the phenomena of electronic, nuclear and muonic magnetic resonances are detailed. In particular, the sensitivities of the material to the electromagnetic field are examined. In particular, the sensitivity and applications of these spectroscopies at the nanoscale of the material are described. The teaching is accompanied by practical work on laboratory set-ups.

Topics:

1. Radiation-material interaction of metallic and dielectric materials
2. Radiation-magnetic material interaction

MODALITÉS D'ORGANISATION

Alternating lectures and tutorials. Simulations/illustrations in Python or Octave of some of the physical phenomena discussed during the lectures. Practical works in laboratory equipmenst of some of the spectroscopies discussed in the course. Student work on review articles.

PRÉ-REQUIS OBLIGATOIRES

Electromagnetism

Quantum mechanics

Physical properties of solid matter

VOLUME HORAIRE

- Volume total: 56 heures
- Cours magistraux: 30 heures
- Travaux dirigés: 18 heures
- Travaux pratiques: 8 heures

CODES APOGÉE

- Aucune valeur définie.

M3C

Aucune donnée M3C trouvée

POUR PLUS D'INFORMATIONS

Aller sur le site de l'offre de formation...

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