INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

Liste d'éléments pédagogiques

Practical info

Location(s)

Toulouse

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

NanoPhysics and Nanochemistry

ECTS
4 crédits

Hourly volume

Practical info

Location(s)

Toulouse

Innovative technologies, devices and materials

ECTS
5 crédits

Hourly volume
54h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain:

- plasma processes
- new technologies and materials for the microelectronics applications
- concepts of the physics of continuous media
- quantum phenomena such as diffusion, electron paramagnetic resonance, and quantum cryptography: entangled states, single-photon and pairs of entangled states source based on semiconductors quantum dots.

The student will be able to apply the quantum mechanics formalism to describe innovative devices at the nano-scale.

The student will be able to:
- choose the kind of scanning probe microscopy well adapted to a specific application/characterization
- analyze and interpret basic images of scanning probe microscopy.

Necessary prerequisites

Electromagnetism
Quantum Mechanics (I4GPPM11)
Mathematics: matrix calculus and differential equations
Physical Metallurgy (real crystal, diffusion, precipitation, nucleation and growth)
Basic knowledge of symbolic computational tool like Maxima.

Practical info

Location(s)

Toulouse

Physics Engineering and Economic Development

ECTS
5 crédits

Hourly volume
75h

Introducing

Objectives

This educational unit is composed of three distinct lectures. Two of them are technological: Physics of semiconductor heterostructures and Telecommunication satellites/RF Functions, the third being centered on the impact of modern science: Nano Cultures.

Multiple objectives are targeted:

- Acquire the fundaments of the recent innovations in semi-conductor devices for microelectronic industry
- Understanding and modelling of semiconductor heterostructures
- To be able to describe the basic Telecommunication payload architecture by understanding the functional description of a bent-pipe transponder
- To acquire good understanding of each RF equipment (Requirements, RF drivers, technologies and associated tips)
- Develop a personal thinking on the impact of sciences on society fin relation with global environemental changes
- Analyse and criticize the nature of Science and technology
- Construct a research project forming sense with respect to personal values and societal challenges

Necessary prerequisites

- Course on "semiconductors" given in 3IMACS.
- Use of decibel units
- RF basics (noise, gain¿)

Practical info

Location(s)

Toulouse

Applied physics and Scientific Communication

ECTS
5 crédits

Hourly volume
28h

Practical info

Location(s)

Toulouse

Human relations

ECTS
6 crédits

Hourly volume
78h

Introducing

Location(s)

Toulouse

Objectives

L'étudiant devra être capable de :
-Analyser des situations de groupe avec des concepts issus de la psychologie sociale
-Identifier les dimensions éthiques de ces situations et prendre position
-Repérer et comprendre des informations liées aux RH
-Analyser une situation de management d¿équipe en référence à un cadre théorique
-Formuler et argumenter des solutions managériales
-Agir dans un milieu naturel : analyser, décider, agir ; mettre en œuvre la sécurité, utiliser du matériel spécifique. découvrir un site.
-Respecter et s'intégrer dans un environnement différent de ses habitudes
-S'engager avec cohérence dans le projet d'activités
-Prendre part activement au collectif
-Valider son projet professionnel et construire une stratégie pour trouver un emploi

Necessary prerequisites

None

Practical info

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

rapport bibliographique

ECTS
1 crédits

Hourly volume

Practical info

Location(s)

Toulouse