INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

CONTINUING EDUCATION_CT2 – APPLIED PHYSICS

Practical info

Location(s)

Toulouse

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

Training period 4th year

ECTS
9 crédits

Hourly volume

Practical info

Location(s)

Toulouse

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

Training period 5th year

ECTS
21 crédits

Hourly volume

Practical info

Location(s)

Toulouse

Advenced intrumentation 1

ECTS
5 crédits

Hourly volume
62h

Practical info

Location(s)

Toulouse

Instrumentation advanced 2

ECTS
4 crédits

Hourly volume
58h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
Real Time : Real time concept, scheduling, rules to develop a real time application, determinism and jitter concepts
Can Bus : General CAN concept, from concept to protocol
Network : Interest of local network for tests and measurements applications.

The student will be able to:
Real Time : Develop a real time application running on National Instruments Compact RIO
Can Bus : Manage communication between two CAN nodes
Network : Manage network technologies to realise a simple project

Necessary prerequisites

General computing
LabVIEW programming
Labwindows/CVI programming

Practical info

Location(s)

Toulouse

Instrumentation Lab

ECTS
5 crédits

Hourly volume
35h

Practical info

Location(s)

Toulouse

Gas Sensor

ECTS
5 crédits

Hourly volume
34h

Introducing

Objectives

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

- the approach and the different steps for the conception and realization of a micro- and nano-electronic by integration of nano-objects synthesized as a colloidal solution;
- the operating model of a nano-sensor

the student will have understood and be able to explain:
- the main concepts and the experimental practices about nano-object synthesis and stabilization of colloidal solutions;
- the main concepts and the experimental practices about deposition of nano-objects from a solution into 2D and 3D arrays on a surface;
- the physical principles of nanoparticles based sensors (gaz sensor, strain sensor ¿).

The student will be able to:
- produce a sensor relying on nanoparticle arrays with particles synthesized and assembled during the project;
- measure the sensor properties and describe how it works;
-discuss the results obtained and suggest improvements..

The student will be able to:
- suggest a reasonable solution for the realization of a sensor gathering the different concepts described above;
- produce an expertise on the conception and the practical realization on a novel sensor.

Necessary prerequisites

Master 1 in Physics, Applied Physics, Chemistry or Material Science or equivalent

Practical info

Location(s)

Toulouse

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES 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

Instrumentation

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

Laser and OptoElectronics

ECTS
2 crédits

Hourly volume

Practical info

Location(s)

Toulouse

Management, Organisation in a group, professionnal behavior

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

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English

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse