

2nd YEAR MIC_SEMESTER 3 INSA

Practical info

Location(s)

 Toulouse

Algebra and analysis

 ECTS
7 crédits

 Hourly volume
77h

Practical info

Location(s)

 Toulouse

Electromagnetism

 ECTS
4 crédits

 Hourly volume
38h

Introducing

Objectives

Objectives:

At the end of this module, the student will have understood and be able to explain:
the basic theoretical concepts of electromagnetism and of the propagation of electromagnetic plane waves in vacuum.

The student will be able to:
calculate electromagnetic fields from high symmetry charge and current distributions.

Necessary prerequisites

Necessary knowledge:

Electrostatics 1A
Electrokinetics 1A

Practical info

Location(s)

 Toulouse

Computer programming & Unix Operating System



ECTS
4 crédits



Hourly volume
51h

Introducing

Objectives

Objectives:

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

Computer programming :

- breakdown into functions: designing procedures, passing parameters
- differences between basic data structures: arrays, records, pointers and linked lists
- recursive algorithms
- basic algorithms for searching, sorting, and merging arrays

Unix :

- main issues associated to the file system and the associated commands
- main issues associated to the organization and the management of process
- main issues associated to the shell

The student will be able to:

Computer programming :

- analyze an advanced problem
- break it up into subprograms
- choose appropriate data structures
- specify (recursive) algorithms
- implement algorithms in ADA language
- specify and realize test cases.

Unix :

- managing files and directories thanks to Unix shell commands
- coding shell programs including variables, iterative structures, control structures, redirection and pipe mechanisms
- managing process thanks to Unix shell commands

Practical info

Location(s)

 Toulouse

Logic and hardware computing



ECTS
4 crédits



Hourly volume
38h

Introducing

Location(s)

 Toulouse

Objectives

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

- ∫ combinational logic
- ∫ sequential logic : synthesis and analysis
- ∫ information coding
- ∫ Computer architecture's models
- ∫ memory hierarchy (cache, main memory, secondary memory)
- ∫ virtual memory and pagination
- ∫ processor's architecture and functional model

The student will be able to:

- ∫ do the minimal synthesis and the analysis of a combination system
- ∫ do the minimal synthesis and the design of a sequential system with flip-flops (including sequencer)
- ∫ Extract, explain and justify, given a scheme, the structural components of a machine (associated process architecture, exchanges's nature, field of utilization, ∫)
- ∫ Describe, given a machine state and a task, the different actions at the hardware layer to process the task (operations's scheduling, components involved, ∫)
- ∫ Identify, given an algorithm and a memory state, the successive internal states of a processor's cache

Practical info

Electronic systems for communications



ECTS
4 crédits



Hourly volume
60h

Introducing

information

Objectives

Objectives:

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

- Fundamentals of signal processing (amplification, filtering, Fourier transform)
- Ideal operational amplifier (OA) and limitations of real OA
- Basic analog circuits
- Conditions of linear/saturated regime of an OA
- Difference between analog and digital electronics
- Basic principles of analog to digital conversion (sampling, quantification, Shannon theorem)
- Physical characteristics of a digital circuit
- Architecture of simple digital circuits based on gates and latches
- Basic principles of transmission of digital signals
- Basic principles of analog and digital modulations

The student will be able to:

- Compute the Laplace transform of the transfer function for an analog circuit
- Design a first order filter
- Design a simple analog function based on OA (amplifier, integrator...)
- Design an analog to digital converter
- building analog and digital circuits using datasheet

Necessary prerequisites

Necessary knowledge:

- General laws of electricity
- Signal processing basics (Fourier transform, frequency domain representation)
- Logic systems

Practical info

Location(s)

 Toulouse

Company knowledge and communication

 **ECTS**
5 crédits

 **Hourly volume**
75h

Introducing

Objectives

Objectives:

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

- how to give an oral presentation
- some of the historical, geographical and/or geopolitical aspects of different English-speaking socio-cultural contexts
- how to produce a structured written synthesis in French.
- how to write a training period report and present it orally
- inner workings of contemporary economy and interdependence of macroeconomic scales

The student will be able to:

In French

- write the synthesis of a set of press articles and present it orally with Powerpoint visual aids
- write a training period report and give an oral presentation describing a particular company, reporting on and analysing a work experience.

In English:

- give a Powerpoint oral presentation in front of a group and orally interact with the audience
- demonstrate creativity, initiative and open mindedness in teamwork

- develop a thorough knowledge and a critical mind about different English-speaking socio-cultural contexts, taking into account historical, geographical and/or geopolitical considerations.

In Economics :

- understand current major economic and societal stakes
- discuss and debate using arguments grounded in the knowledge of fundamental economic mechanisms and some economic thinking theories

Necessary prerequisites

Expression 1 in the first-year « Grand Domaine Humanités » (D1ANHU01)

Writing and oral skills in English in the first-year « Grand Domaine Humanités » (D1ANHU01)

Practical info

Location(s)

 Toulouse

Improving one's autonomy and building one's own professional project – level 2A



ECTS
2 crédits



Hourly volume
44h

Practical info

Location(s)

 Toulouse

Refresher course 2nd year



ECTS



Hourly volume
162h

Practical info

Location(s)

 Toulouse