INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

3rd YEAR MIC_SEMESTER 5 INSA

Practical info

Location(s)

Toulouse

Optimization, numerical analysis and Markov Chains

ECTS
6 crédits

Hourly volume
87h

Introducing

Necessary prerequisites

Necessary knowledge :
- Precedent courses on the following subjects : linear algebra
- Differential Calculus from the 2nd year
- Probability course of second year level.
- Basic programming in Python

Practical info

Location(s)

Toulouse

OS, C Language, Computer networks, data bases

ECTS
6 crédits

Hourly volume
87h

Practical info

Location(s)

Toulouse

ODE and numerical resolution

ECTS
4 crédits

Hourly volume
47h

Introducing

Objectives

Objectives:
At the end of this module, the stubent will have understood and will be able to
- Define A Cauchy Problem
- Prove the existence and uniqueness of the solution of a linear and non linear Cauchy Problem
- Obtain qualitative properties for the solution of an ODE and draw a phase portrait
- Analyze and develop algorithm to solve an ODE

Necessary prerequisites

Necessary knowledge:
Differential and integral Calculus, linear algebra

Practical info

Location(s)

Toulouse

Measure Theory and probability

ECTS
4 crédits

Hourly volume
45h

Introducing

Objectives

Objectives:
We will introduce the modern notion of integration established by H. Lebesgue at the beginning of the 20th century. At the end of the course, the student will be able to (among other things):
- show that a given function is measurable and integrable in the Lebesgue sense;
- use the notion of measure;
- switch a limit (or a derivative) and an integral sign;
- understand the various concepts of convergence (almost everywhere, Lp, etc);
- discuss the belonging of a given function in Lp;
- use Cauchy-Schwarz¿ and Hölder¿s inequalities;
- compute a convolution product.

Practical info

Location(s)

Toulouse

Database 1 and Web programming

ECTS
4 crédits

Hourly volume
40h

Introducing

Objectives

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

Database 1:
- The different data models, their advantages and limits
- What is DBMS (Database management system)
- UML based data model
- The different concepts of the relational model
- The normalization and its importance
- Data integrity constraints

Web programming

¿ Understand the concepts and technologies of the Web
¿ HTML5 language
¿ CSS language
¿ JavaScript language

The student will be able to:

Database 1:

- Design a relationnal database based on UML
- Derive the relational model from UML model and vice versa
- Normalize and validate a relational model

Web programming

- Design a static Web site with HTML5
- Define a CSS file
Write scripts with JavaScript

Necessary prerequisites

Necessary knowledge :
Algorithmic for Web programming

Practical info

Location(s)

Toulouse

Theoretical tools for computer science

ECTS
4 crédits

Hourly volume
60h

Introducing

Objectives

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

- Complexity of algorithms and problems
- Information theory and its applications to data compression, error-correcting codes and cryptography
- Linear programming
- Regular expressions

The student will be able to:

- Evaluate the asymptotic complexity of an algorithm, recognize and apply some algorithmic patterns (divide and conquer, dynamic programming, greedy algorithms), and determine the complexity class of a problem
- Use basic information theory concepts in data compression, error-correcting codes and cryptography settings
- Develop a linear programming model for a problem and solve it with the simplex algorithm
- Identify a problem solvable using regular expressions, choose the appropriate tool, and find quickly the solution

Necessary prerequisites

Necessary knowledge:
Basic mathematics (linear algebra, probabilities, modular arithmetic)
Algorithmics, information representation, data structures, Unix Shell

Practical info

Location(s)

Toulouse

Improving one's autonomy and building one's own professional project – level 3

ECTS
2 crédits

Hourly volume
44h

Practical info

Location(s)

Toulouse

Job search and language

ECTS
5 crédits

Hourly volume
37h

Introducing

Objectives

Job search modules in French and in English

By the end of these modules, the student is expected to understand how to successfully obtain an internship or job and will grasp the differences in the job-search process between France and English-speaking countries.
The student will be able to:
¿ make a personal statement, and start developing a career plan
¿ use current research tools (web, online networks, company websites) to conduct a documentary survey on recruitment
¿ seek work placements matching his/her objectives and profile
¿ find and analyze an English advert in his/her future field
¿ adapt his/her CV and cover letter to a specific job application
¿ write a CV in English following various country-relevant templates
¿ ensure his/her job application meets the company's requirements
¿ prepare for an interview (self-knowledge, company awareness, preparation of adequate questions)
¿ show adequate degree of proficiency in job search related technical English to be able to take a professional job interview

Second language course (optional ¿ commitment for years 3 and 4)

The objectives are defined according to European specifications for the five language skills and specific to the various languages proposed - German, Spanish, and Chinese ¿ and to students' levels.
Whenever his/her level is sufficient, the student will be able to:
¿ Synthesize and present professional documents
¿ give an oral presentation in front of a group
¿ take into account the various dimensions of interculturality
¿ Analyze a job ad
¿ simulate a job interview
¿ write a CV and a cover letter in the studies language

Remedial English (upon teachers¿ decision)

In some specific cases, a remedial English course is offered in replacement of the second language course with the objective of reinforcing the language skills useful for the TOEIC, i.e. reading and listening, grammar and vocabulary.

Necessary prerequisites

¿ TRE (in French): min. C1 level in French ¿ Course not open to exchange students

¿ Job Search (in English): min. B1 level in English ¿ Course open to exchange students

¿ LV2: min. A2 in the language studied ¿ Course not open to exchange students

Practical info

Location(s)

Toulouse

Engineering and ecological issues

ECTS
3 crédits

Hourly volume
30h

Practical info

Location(s)

Toulouse

[FRANCAIS] Remise à niveau 3A MIC

ECTS
3 crédits

Hourly volume
145h

Practical info

Location(s)

Toulouse

Political sciences semester 1

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
1 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
2 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
4 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
5 crédits

Hourly volume

Practical info

Location(s)

Toulouse