

NETWORKS AND TELECOMMUNICATIONS COURSES

Practical info

Location(s)

 Toulouse

Mobiles Networks and Wireless Networks



ECTS
6 crédits



Hourly volume
71h

Introducing

Objectives

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

Mobile networks (2nd and 3rd generation – GSM to UMTS) and wireless local and personal networks functioning and deployment principles and their communication and network architecture

The student will be able to:

- understand the cellular architecture of mobile and wireless networks
- design and deploy a mobile cellular network
- handle the communication and network architecture of mobile networks, the roaming and handover principles
- handle the radio interface and its impact on the design of the network architecture
- understand the voice and image coding for wireless mobiles networks
- understand the information transmission (voice, data, multimedia) in mobile and wireless network
- understand the energy management and the principles to adapt the emission power in wireless and mobiles networks

-identify the specificity of wireless local and personal networks and their effects on the network architecture

-handle the main functioning principles of local and personal wireless networks

-design and deploy an enterprise local wireless network

Necessary prerequisites

Telecommunications system
C language and computer networks
Network programming, object oriented programming and regular expressions
Telecommunication specialization

Practical info

Location(s)

 Toulouse

Transmission systems and techniques



ECTS

6 crédits



Hourly volume

68h

Introducing

- Use a STM32-type microcontroller to carry out numerical modulations (BPSK, QAM, ...) in a software radio setting.

Objectives

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

- How the properties and limitations of channels influence transmission
- The different perturbation sources
- The properties of most antennas
- Modulation and demodulation techniques
- Coding and error-correction techniques.

Practical info

Location(s)

 Toulouse

The student will be able to:

- Identify the limitations of a channel and how they alter the signal
- Build a model of a transmission channel, so as to conceive an adapted and optimized transmission link
- Dimension an antenna, taking into account the propagation setting

Internet and Security



ECTS
5 crédits



Hourly volume
62h

Introducing

Objectives

- Network interconnection part:

the basic concepts and techniques allowing interconnecting local area networks in the Internet: repeater, bridge, router the basic concepts and techniques allowing interconnecting LAN in the Internet : subnetting, CIDR, VLAN, VPN, applicative proxy, NAT the main protocols of the TCP/IP Internet architecture : UDP, TCP, IP, ARP/proxy ARP, ICMP, DHCP (Note : RIP, OSPF and BGP are briefly introduced).

- Distributed algorithm part:

principal characteristics of the distributed systems (asynchronism, distribution of control and the data, absence of common knowledge, dynamicity,...), their specific problems and the difficulty of their solution in a distributed context (mutual exclusion, management of the shared data, distributed choice, diffusion, detection of the termination,...), some generic algorithmic tools allowing to solve them: causality, distributed recursivity (waves) and distributed iteration (phases), specific topological structures.

- Security part:

principles of computer security through the properties

that characterize it as well as the classification of the major threats and the corresponding countermeasures, main vulnerabilities of computer networks, in particular the Internet network as well as the corresponding countermeasures, main software vulnerabilities as well as some countermeasures.

The student will be able to:

- Network Interconnection part:

do architecture choices allowing to take into account requirements and constraints associated to a LAN interconnection, do basic or complex addressing and routing schemas, set up (administrate) Ethernet and IP networks in the basic and advanced interconnection contexts considered in the course.

- Distributed algorithm part:

solve generic problems involved in the implementation of systems distributed handle the most general tools allowing to conceptualize them.

- Security part:

analyse a computer network and its applications in order to identify the main vulnerabilities, from software and network point of view

propose corresponding countermeasures to improve the security of the whole system

Practical info

Location(s)

 Toulouse

Object Oriented Design and Object Oriented Programming



ECTS
6 crédits



Hourly volume
75h

Introducing

Objectives

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

Object oriented based on the UML language, and the object oriented programming through based on the Java language.

The student will be able to:

- * Master object theory and the design modelling language UML
- * Master a design methodology based on use cases and integrating detailed analysis and design phases.
- * Apply the object concepts and a design methodology using the JAVA language
- * Understand the advantages of following best practises guidelines provided by the use of design patterns
- * Configure and use the configuration management tools (e.g. svn, cvs, etc.)
- * Explore the use of standard documents for project management, requirements specification, software

design and software tests.

* Configure and use collaborative workspaces applied to the software development process.

* Have an initial experience to the project management challenges in a software development process project.

* Plan and play designer and developer roles within a software development process.

Necessary prerequisites

Structured programming (ADA, C, Pascal,...)

Practical info

Location(s)

 Toulouse

Improving autonomy and building a professional project



ECTS

4 crédits



Hourly volume

39h

Introducing

Objectives

Construire une équipe projet, Approfondir ses connaissances,

Investir le métier, les domaines d'activité, les fonctions.

L'étudiant devra être capable de :

- d'analyser avec les autres un problème posé (Identifier le problème, définir les axes d'approche dans un bilan interactif : organisation, physique, technique, stratégique, motivation, confiance...
- de décider ensemble (permettre à tout le monde d'exprimer son avis, ajuster et réguler sa conduite en fonction de l'analyse collective),
- d'identifier les ressources du groupe (sens critique, repérage des points forts et faibles de chacun).

Practical info

Location(s)

 Toulouse

Improve your management abilities



ECTS
4 crédits



Hourly volume
45h

Introducing

Objectives

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

- * The basic rules of business law
- * The objectives, principles and means of marketing
- * The principles and procedures of financial diagnosis and / or investment

The student will be able to :

Apply principles and rules of management and law in simple situations. Take into account the parameters of the management (customer needs, cost effectiveness and legal compliance).

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