

WIRELESS TELECOMMUNICATION AND IoT SYSTEMS



OBJECTIVES

The Wireless Telecommunication and IoT Systems specialization presents all the necessary building blocks for the design, the planning, the deployment and the optimization of mobile wireless communication and connected object networks, as well as digital techniques for transmission and communication.

The Wireless Telecommunication and IoT Systems engineer is an expert that can advise IoT clients on the technologies to choose to inter-connect objects. He/she has the know-how to implement the next generation technologies by operating the highly efficient networks.

JOB PROSPECTS

R&D engineer, Integration Engineer, Validation Engineer, Research Engineer, Telecommunication Support Engineer, Technical Sales Engineer, Telecom Project Manager.



COURSE CONTENT

SEMESTER 1

PROJECT-BASED LEARNING IN ELECTRONIC AND SIGNAL

- Analog electronics: signal conditioning, analog filter, power management
- Digital electronics: Microcontroller based sensor management, bluetooth link
- Fourier series and transform, Sampling, digital filtering

NETWORK FUNDAMENTALS

- Network communication, Communication channel
- Layer approach, OSI model, TCP/IP model
- Network devices, Network addressing models

CELLULAR MOBILE TECHNOLOGIES

- Architecture and Engineering of cellular mobile communications networks
- Characteristics of the radio propagation (noise, interference, protection against the errors)
- Mobility & Security in cellular communications networks
- Multiplexing users

IOT NETWORKS

- IoT Networks: requirements, classification, security aspects
- Body Area network
- Autonomy and Miniaturisation aspects
- Project on conception and deployment of connected objects

LANGUAGES AND CULTURES

SEMESTER 2

RADIO COMMUNICATIONS

- Modeling of the transmission chain
- Adaption to the transmission channel: formatting, constellations
- Theory of information and channel coding: error correcting code

ELECTRONICS FOR IOT

- Deepening on Microcontroller

- Battery management, Low Power Design, Power conversion
- Wireless link, protocols and capabilities low power
- Green communication design, System implementation

ROUTINE PROTOCOLS AND LOCAL NETWORK SWITCHING

- Static & dynamic routing
- Distance-Vector routing protocols
- Link-State routing protocols, Fine-Tuning Routing Protocols
- Access Control List, PTP connections, NAT, DHCP

CYBER SECURITY

- Information systems security
- Web application and network security
- Introduction to Cryptography

INTERNATIONAL BUSINESS INNOVATION PROJECT

- Build real business model in a multicultural team
- Create innovative idea with marketing & business strategies
- Present final business model to professionals

LANGUAGES AND CULTURES

SEMESTER 3

CONVERGENT SERVICES AND TECHNOLOGIES

- Voice over IP (signalling, addressing...)
- Unified communications, NGN, IMS
- Cloud computing

DATA PROCESSING AND HIGH SPEED COMMUNICATIONS

- Advanced techniques of redundancy
- Compression, cryptography
- Optical & satellite networks

PROJECT

- The project is composed of an advanced case study. The students will be called upon

to use the knowledge, design techniques and tools that they learnt through their courses

FRENCH LANGUAGE COURSE

MANAGEMENT TRAINING

- Economics principles, Intercultural relations
- Corporate organization, International sales
- Career workshops (Internship job hunting, CV, interview skills)

CHOICE OF 2 ELECTIVE COURSES AMONG:

SYSTEM INTEGRATION

- Open-source strategy
- Tools for Integration (BPM, ETL, BI, Spring)
- Test and Validation etc

ROUTING AND ADVANCED ARCHITECTURE

- Core network architectures based on protocols such as MPLS
- Implementation of IPv6 networks, and planning for existing network migrations
- Advanced inter-AS routing protocols (autonomous system)

CONNECTED AND AUTONOMOUS VEHICLES

- Connected cars and urban equipment
- Deep learning and automatic car driving
- Sensor, Vehicular Ad-hoc Network, Security

MOBILE DEVELOPMENT

- Introduction to the dedicated services for mobiles
- Handsets capabilities and market overview
- Android development basics & tutorials
- Project

SEMESTER 4

INTERNSHIP

The internship with an international company will enable students to display valuable professional skills and attitudes developed during the three academic semesters. ISEP will provide you with assistance in your search for an internship. Companies usually give a stipend to the trainees.