

SOFTWARE ENGINEERING



OBJECTIVES

With the rapid development of computerization and networks in our daily life, the software development is unavoidable. The needs of talented software engineers with a good expertise and capacity for technology monitoring are required to tackle new markets and to innovate in software.

The software engineer is an expert who can adapt himself/herself in any environment. He/She is involved in the design, implementation, development of software in several industrial domains. He/she has a global view and a large knowledge from hardware to algorithm layers.

JOB PROSPECTS

IT consultant, IT project manager, expert of development in major industrial groups (Banks, Automotive, Aircraft...) or start-up, R&D in software industry (IBM, Google, Microsoft...).



COURSE CONTENT

SEMESTER 1

PROJECT-BASED LEARNING IN IT AND IoT

- Database management system: relational and object models, database schema, queries
- WEB architecture: client, server, communication protocols
- HMI: ergonomics, dynamic contents generation, formatting
- Propagation & antenna, digital transmission, link budget

CYBER SECURITY

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

NETWORK FUNDAMENTALS

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

JAVA/SOFTWARE ENGINEERING

- Java Programming
- Software engineering
- Agile software development methods

LANGUAGES AND CULTURES
ENGLISH LANGUAGE COURSE
FRENCH LANGUAGE COURSE

SEMESTER 2

DATA BASE AND BIG DATA

- Advanced querying techniques
- Non-relational databases

ADVANCED ALGORITHMIC AND PROGRAMMING

- Graph theory, algorithm design
- Advanced Java: compound design patterns, network programming, functional programming

COMPUTER MICROSYSTEMS

- C language programming: memory allocation, pointer and API

- Operating system description: process/thread/memory/supervision, shell & system programming

WEB TECHNOLOGIES

- Client-side Web application: Java Servlet, Java Server Pages, Cookies, Sessions, JDBC, MVC
- Server-side Web application: WEB development methods and process, HTML, CSS, Javascript, HTML5, CSS3/4, Frameworks and Javascript tools, AJAX

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

DISTRIBUTED PROGRAMMING AND ARCHITECTURE

- Typology of distributed systems
- Distributed applications properties: interoperability, scalability/elasticity, load balancing, consistency, fault tolerance
- Communication: protocols, topologies
- Concurrent programming
- Distributed algorithms & application patterns

PROGRAMMING LANGUAGES AND COMPILERS/FORMAL APPROACHES

- Abstract syntax trees
- Compilation algorithms
- Proof of program properties, model-checking
- Typed programming languages, lambda calculus

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:

MOBILE DEVELOPMENT

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

ADVANCED WEB TECHNOLOGIES

- Software infrastructures and Web services
- Enterprise and information systems architecture

AUDIT AND RISK MANAGEMENT

- Data security, Secure Programming
- Main application vulnerabilities (Cross scripting (XSS), SQL injection...)

MACHINE LEARNING

- Linear predictors, convex learning
- Gradient descent, kernel methods
- Support vector machine, decision trees

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.