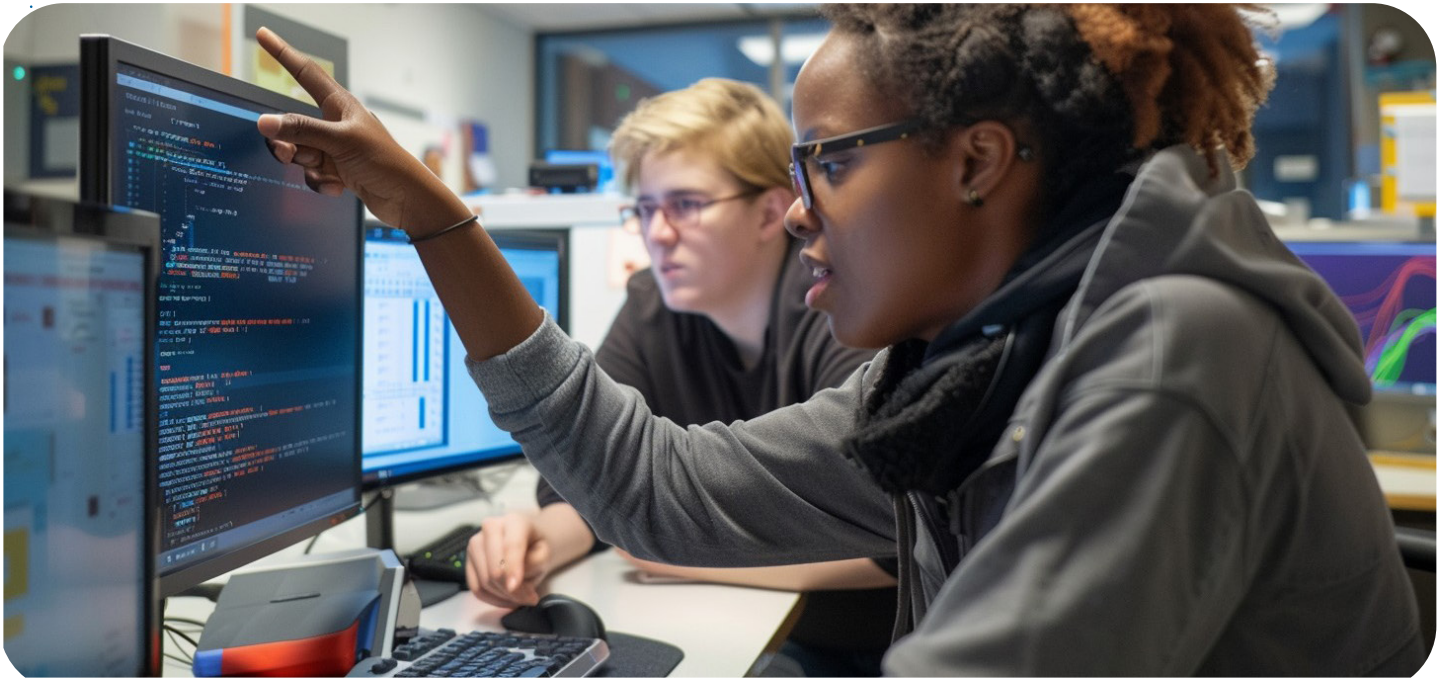
IT Architecture & Security



OBJECTIVES

The growing cybercrime incidents have a huge impact on companies: economic loss, threat to reputation, bankruptcy, etc. Therefore, securing its information systems and data is a top priority for all organizations.

The main role of the IT Architecture and Security engineer is to deploy a security policy with a level adjusted to the needs and nature of the business of the company. To achieve this goal, the engineer must understand the business processes and the organization of the services and must master the security standards and mechanisms, as well as the architecture of the underlying networks,

The information system services, and applications. The engineer also ensures a technological watch on new threats so that he can improve and strengthen the security of the company. He/she is involved in raising user awareness of security issues.

JOB PROSPECTS

Cybersecurity Engineer, Network/ Infrastructure Architect, Data Protection Engineer, Information systems security Manager, Application Security Engineer, Security Expert, systems Engineer, Information security analyst, Digital Forensic Engineer, IT auditor, Incident Engineer,...

Course content

SEMESTER 1

PROJECT-BASED LEARNING IN WEB DEVELOPMENT
- Database management system : relational and object models, database schema, queries analog filter, power management
- Web architecture : client, server, communication protocolssensor management, bluetooth link
- HMI : ergonomy, dynamic contents generation, formatting
- Propagation & Antenna, Digital transmission, Link budget

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

DATA SCIENCE FUNDAMENTALS
- Probability theory
- Statistics (descriptive statistics, statistical theory of estimation, hypothesis testing)
- Data science (principal component analysis, linear regression)

CYBER SECURITY
- Information systems security
- Web application and network security
- Introduction to Cryptography, etc.

INTRODUCTION TO RESEARCH
- Definition of research: procedures, organization and purposes
- Targeting information (specialized sites, books, open archives, etc.)
- Bibliographic study: synthesis of the research works
- Modeling a scientific problem
- Writing a scientific publication
- Ethics, integrity and scientific rigor

ENGLISH, FRENCH AND HUMANITIES

SEMESTER 2

INFORMATION SYSTEMS ARCHITECTURE
- Hardware and software architecture
- Service-oriented architecture and Rest APIs
- Virtualization and administration of an operating system
- Cloud Computing

BLOCKCHAIN
- Blocks, transactions, and chains
- Cryptography Basics
- Blockchain Security and use cases

DATABASES AND BIG DATA
- Advanced querying techniques
- Non-relationnal databases

CLOUD AND SECURITY
- Confidentiality, Authenticity, Integrity, Availability, Traceability, Non-repudiation
- Security in the Software Development Life Cycle (SDLC), Security by design
- Evaluation of the effectiveness of software security
- ANSSI rules
- Privacy by Design and personal data processing

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE ONE COURSE AMONG:

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

INTRODUCTION TO ARTIFICIAL INTELLIGENCE
- Applications of artificial intelligence to problem solving
- Methods of problem formalization and knowledge representation
- Resolution algorithms associated with these representations

RESEARCH AND INNOVATION
MANAGERIAL TRAINING
ECO-DESIGN
PERSONAL AND CAREER

SEMESTER 3

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

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE TWO COURSES AMONG:

BUSINESS ORGANIZATION AND INFORMATION SYSTEMS
- Generic Organization of a firm (architecture, modules)
- Sectoral organization (financial, banking / insurance, government, telecom, education, health,...)
- Developing a strategy and its implementation
- Monitoring the implementation of the strategy
- Integration of different actors in the value chain (B2B, e-commerce, CRM)
- Integrating data (indicators, Business Intelligence, distribution of data)
- Apprehension of the IS environment, competitive intelligence, business intelligence

TESTING AND AUTOMATION
- Test automation architecture (TAA), strategy (TAS) and framework (TAF)
- Testability of the SUT (System Under Test)
- Metrics and reporting for test automation
- Transition from manual testing to an automated environment.

GLOBAL HEALTH SYSTEMS
- Global health systems, comparing and contrasting
- The role of data, information, and knowledge
- Global health challenges
- Health impacts, health outcomes, and the measurable objectives of Health interventions
- Spaces and places for care delivery
- Continuum of care & care coordination

SOFWARE SECURITY
- Fundamental notions about computer security & software security
- Malwares and software's low level vulnerabilities
- How to write a secure code (DevSecOps and security in SDLC)?
- Web application vulnerabilities

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

SEMANTIC WEB AND KNOWLEDGE MANAGEMENT
- Evolution of Hypertext: from primitive versions to the Web (WWW) and Social Web
- Evolution of Conceptual Hypermedia: from basic ideas to the Semantic Web
- Knowledge Representation
- Knowledge Management
- Knowledge Engineering

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. Companies usually give a stipend to the trainees.

Syllabus: subject to minor modifications