Cloud, System & Security

TAUGHT IN FRENCH

/ AIMS

The Cloud, System and Security major aims at training ESEO engineers to facilitate the transition of corporate information systems to «Cloud Computing». This change implies circulating data, storing it and provisioning the appropriate resources to process it. The IT infrastructure is dematerialised and should provide on-demand services at the infrastructure (IaaS: Infrastructure as a Service), platform (PaaS: Platform as a Service) or application level (SaaS: Software as a Service).

The aim is to meet the needs of modern applications in terms of adaptability in a quick and efficient manner. The protection of information systems facing the growing number of new threats like cyber-attacks is a vital component of this major.

/ ACQUIRED SKILLS

You will acquire skills in designing, implementing and integrating a reliable and secure information system. You will have a full understanding of the information system combined with issues of hardening services and virtual infrastructures, such as defining the issues and benefits and identifying the impacts on design and operational management.

/ CAREER OPPORTUNITIES

An Information System is a key component for many companies. The engineer will be able to manage a company's Information System, either as an IT services company provider or as the in-house technical manager. A CSS engineer's skills can further develop into technical expertise, pre-sale as a technical sales engineer, and lead to positions as Chief Information Officer.

COURSE UNITS

/ SEMESTER 8

- **CSS Project:** 112 hrs – 10 ECTS
- **Test and Validation:** 28 hrs – 2.5 ECTS
- **Information Systems Management:** 28 hrs – 2.5 ECTS
- **Advanced networking:** 28 hrs – 2.5 ECTS
- **Introduction to Security:** 28 hrs – 2.5 ECTS
- **English**: 28 hrs – 2.5 ECTS
- **Transversal Skills:** 28 hrs – 2.5 ECTS

+ 2 Course Units from:

- **Relational Databases:** 28 hrs - 2.5 ECTS
- **System Administration for Linux:** 28 hrs – 2.5 ECTS
- **The Linux Operating System:** 28 hrs – 2.5 ECTS
- **Microsoft Infrastructure:** 28 hrs – 2.5 ECTS

/ SEMESTER 9

- **Final Year Project:** 168 hrs - 14 ECTS
- **Architecture of Datacenter:** 28 hrs - 2 ECTS
- **Design and Security of infrastructures:** 28h - 2 ECTS
- **Choice 1 - Security:** 84h - 6 ECTS Cryptography / Security Offensive / Security Audit
- **Choice 2 - Infrastructure:** 84h - 6 ECTS VMWare Infrastructure (VCenter) / Cloud Orchestration: Openstack / Docker Infrastructure

+ 3 selected Course Units*:

84 hrs - 6 ECTS
(each Course Unit = 28 hrs - 2 ECTS)

* To be chosen from the elective course units listed

Elective Course Units

Elective course units should be chosen from the list below. Only one course unit can be chosen per numbered sub-table.

COURSES	PROVIDED BY
ELECTIVE COURSE UNIT 1	
Wireless Communication	Electronics & IoT
Protocols for the IoT	Electronics & IoT
Green IT	Software & Data
OS for Embedded Systems	Embedded Systems
Cryptography	Cloud, System & Security
ELECTIVE COURSE UNIT 2	
Architecture of Data Center	Cloud, System & Security
Antennas and Software-defined Radio (SDR) 4∗	Electronics & IoT
Android Project	Software & Data
Model-driven Engineering (MDE)	Embedded Systems / Software & Data
ELECTIVE COURSE UNIT 3	
Efficient & Safe Programming	Embedded Systems
Information Systems & Business Strategy 1∗	Software & Data
Offensive Security	Cloud, System & Security
Monolithic Microwave Integrated Circuits (MMIC)	Electronics & IoT
Artificial Intelligence 1∗	Software & Data
Linux Platforms	Electronics & IoT/ Embedded Systems
Embedded Security for the IoT	Electronics & IoT
ELECTIVE COURSE UNIT 4	
Docker Infrastructure	Cloud, System & Security
Real-time Programming	Embedded Systems
Batteries and Energy Harvesting 4∗	Electronics & IoT
Client-side Web Development using REACT	Software & Data
ELECTIVE COURSE UNIT 5	
Machine Learning for Embedded Systems	Embedded Systems
Exploration of a LoRa Tracking IoT Navigation System	Electronics & IoT
Creativity & Innovation	Software & Data
Network Security	Cloud, System & Security
Android Software	Electronics & IoT / Embedded Systems
VMWare Infrastructure (VCenter)	Cloud, System & Security

COURSES	PROVIDED BY
ELECTIVE COURSE UNIT 6	
Formal Modelling	Embedded Systems
Embedded Linux 5∗	Electronics & IoT / Embedded Systems
Infrastructure Monitoring	Cloud, System & Security
Web Technologies and Continuous Integration	Software & Data
Engineering of Communication Systems	Electronics & IoT
ELECTIVE COURSE UNIT 7	
Information Systems and Business Strategy 2∗	Software & Data
Infrastructure Design & Security	Cloud, System & Security
Artificial Intelligence 2∗	Software & Data
Advanced Testing	Embedded Systems
Rapid Prototyping	Embedded Systems
Advanced Processor-based Architectures	Electronics & IoT
Multiphysics Systems	Electronics & IoT
ELECTIVE COURSE UNIT 8	
Advanced Databases & NoSQL	Software & Data
Communications in Embedded systems	Embedded Systems
Systems-on-Chip (SoC) Digital Design 4∗	Electronics & IoT
Security for Embedded Systems	Software & Data
.NET Platform	Software & Data
Cloud Orchestration: Openstack	Cloud, System & Security
ELECTIVE COURSE UNIT 9	
Information Systems and Business Strategy 3∗	Software & Data
Applied Cryptography for Developers (AC4D)	Software & Data
Systems-on-Chip (SoC) Analogue Design 5∗	Electronics & IoT
Artificial Intelligence 3∗	Software & Data
Security Audit	Cloud, System & Security
Operational Security	Embedded Systems

1∗ - 2∗ - 3∗ Students choosing «Information Systems & Business Strategy» and «Artificial Intelligence» should take **all 3 course units** in tables 3, 7 and 9

4∗ Compulsory Course Units for Electronics & IoT students

5∗ One of these two Course Units is compulsory for Electronics & IoT students, depending on the block chosen in semester 8