TELECOM NANCY

UNIVERSITÉ DE LORRAINE

SYLLABUS

SIE S9 (IS4IE)

Information Systems for the Intelligent Enterprise

Initial Training under Student Status (FISE)

UNIVERSITÉ DE LORRAINE — LORRAINE INP — École affiliée IMT

SUMMARY

COMMUN CORE					
UE	**EC/module**	**Modules**	**total hours**	**ECTS**	**Evaluation method**
SEHS9	AN9	Mandatory language - English S9	34	2	ET
	AO	Call for tenders	18	1	CC
	DROIT9	Low	11	1	ET
SEMINAIRE3A	SEM3A	Seminar 3A	35	1	CC
CONF	CONF	Conferences	12	0	Not Evaluated
JEU ENTREPRISE	JEU	Enterprise Serious Game	35	2	CC
PI	PI	Industrial Project	125	8	CC
		TOTAL	**270**	**15**	

Information Systems for the Intelligent Enterprise					
UE	**EC/module**	**Modules**	**total hours**	**ECTS**	**Evaluation method**
STIC 9	MBSE	Model-Based Systems Engineering	36	3	ET
	SDIS	Distributed Systems	28	3	CC
	NOSQL	NoSQL Database	30	3	ET
	AI&C	Artificial Intelligence & Cobotics	24	2	ET
	BI	Business Intelligence	38	2	ET
	EAI	Enterprise Applications Interoperability	36	2	ET
		TOTAL (Major)	**188**	**15**	
		TOTAL S9	**458**	**30**	

Mandatory language - English S9

Teaching unit	***ECTS credits***
SEHS 9	2

Objectives

- Obtaining the TOEIC score required by the school
- Deepening of the four language skills (oral and written expression, oral and written comprehension) with a strong emphasis on oral comprehension
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Training achievements

- Understand the main ideas of complex text and discussions, including technical discussions in his/her field of specialisation.
- Communicate with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party.
- Express him/herself clearly and in detail on a wide range of subjects.
- Give an opinion on a topical issue and explain the advantages and disadvantages of different options.

Refresher course :

- Understand a wide range of long, complex texts and grasp implicit meaning.
- Express themselves spontaneously and fluently without much apparent searching for words.
- Use language flexibly and effectively in social, professional and academic contexts.
- express himself/herself clearly and in a well-structured way on complex subjects and demonstrate mastery of the tools of organisation, articulation and cohesion of discourse.

Evaluation method
Continuous monitoring

Responsible	***Hourly volume:***
Muriel DUVAL	28 hours (28h TD)

Call for tenders	
Teaching unit SEHS 9	***ECTS credits*** 1
Objectives Acquire the techniques needed to organise, plan and monitor a project effectively, in compliance with the contract signed with the customer.	
Training achievements ● Project definition, positioning and validation, key project players, ● Project breakdown and planning, tasks, milestones and deliverables ● Project constraints (cost, deadlines, quality) ● Human resources management: work organisation and skills management, labour relations, change management approaches, corporate culture, conflicts and their resolution, delegation, negotiation and cooperation. ● Studying and responding to a call for tenders: knowing how to write a response and present it to a jury.	
Evaluation method Continuous monitoring	
Responsible Anne-Claire HEURTEL	***Hourly volume:*** 12 hours (4h CM, 8h TD) + 10 hours project

Law	
Teaching unit SEHS 9	***ECTS credits*** 1
Objectives An introduction to the basic principles of intellectual property law, new technology law and employment law. The course involves the participation of professionals (lawyer specialising in digital law, labour inspector).	
Training achievements ● Referring to current legislation when negotiating employment contracts ● Raising awareness of safe working conditions ● Protecting a digital creation ● Incorporating legislation into the design and development of an IT system	
Evaluation method Terminal test	
Responsible Anne-Claire HEURTEL	***Hourly volume:*** 11 hours

Seminar 3A	
Teaching unit SEMINAIRE3A	***ECTS credits*** 1
Objectives To enable students to acquire the essential management and administration skills needed to practise the engineering profession.	
Training achievements ● Draw up a career plan ● Analyse and structure your knowledge, know-how and interpersonal skills and resent them ● Build a case for yourself in a job interview	
Evaluation method Continuous monitoring	
Responsible Zahra RONDEAU	***Hourly volume:*** 35 hours

Conferences

Teaching unit	***ECTS credits***
CONF	0

Objectives

IT is certainly one of the richest fields, due to its expansion into everyday life and the speed of its innovations. Even if it is not possible to know everything about every field, it is important for a good digital engineer to have at least a superficial knowledge of as many areas as possible. The aim of the 3rd year lecture series is to open students up to digital fields other than those taught at the school, so as to cultivate their curiosity and taste for novelty.

Training achievements

- Have a superficial view of other areas of digital not sanctioned by an examination or immediate implementation.

Evaluation method

N/A

Responsible	***Hourly volume:***
Suzanne COLLIN	12 hours

Enterprise Serious Game	
Teaching unit JEUENTREPRISE	***ECTS credits*** 2
Objectives To enable students to acquire the essential management and administration skills needed to practise the engineering profession.	
Training achievements ● Understand how a company operates and the decision-making process. ● Understand the management process: team management of a fictitious company in a competitive market. ● Understand the process by which managers ensure that resources are obtained and used effectively and efficiently to achieve the organisation's objectives. ● Take the relevant decisions in a business management situation (organise, anticipate, choose, calculate, budget, control, correct, etc.).	
Evaluation method Continuous monitoring	
Responsible Zahra RONDEAU	***Hourly volumes:*** 35 hours

Industrial project

Teaching unit	***ECTS credit***
PI	8

Objectives

To make students aware of the practical problems faced by companies by carrying out a needs analysis, feasibility study, development of a demonstrator, validation, etc., based on a problem submitted by a company.

Acquis de formation

- Business skills
  - Write a scoping note,
  - Define technical specifications and/or models,
  - Know how to apply an agile method
  - Determine technical choices (software and hardware architecture) and select technologies,
  - Produce a functional and/or technical solution,
  - Applying southbound validation methods (technical tests, functional tests, proofs, metrology) and northbound validation methods (compliance of the solution with specifications and user expectations.
- Transverse skills
  - Mastering project management (planning, identifying, defining and prioritising activities to be carried out, carrying out actions, adapting to constraints and changes, evaluating results,
  - deadlines and procedures,
  - reporting to stakeholders,
  - ability to organise and run meetings,
  - managing a multi-stakeholder configuration (academic management, industrial management, project group members,
  - ability to work as part of a team (make commitments, motivate and involve others, manage conflicts and different points of view, negotiate compromises),
  - professional communication skills (presenting a finished product orally and in writing in French, leading a training course, etc..

Evaluation method

Continu monitoring

Responsible	***Hourly volume:***
Anne-Laure CRUGNOLA / Gérald OSTER	250 hours project

Model-based systems engineering	
Teaching unit STIC 9	***ECTS credits*** 3
Objectives ● To present the basic concepts of business modelling, model-driven systems engineering and the different approaches to the problem (systemic approach, object approach, requirements, etc.). ● Introduce the problem of integrating business processes through reference architectures. ● Master and apply business modelling models, languages and tools in order to derive a relevant information system enabling the integration of the various business processes.	
Training achievements ● Apply a systems approach to the engineering of a complex information system ● Apply systems engineering standards and best practices ● Use a standard modelling framework to study generic business processes ● Model business processes relating to a defined objective ● Analyse the functional and technical requirements for modelling a system	
Evaluation method Terminal test	
Responsible Hervé PANETTO	***Hourly volume:*** 46 hours (14h CM, 8h TD, 24h TP) + 20 hours project

Distributed systems	
Teaching unit STIC 9	***ECTS credits*** 3
Objectives Study the different types of distributed architecture	
Training achievements ● Differentiate between a network error and another type of error ● Write a program that allows communication between two computers ● Explain why it is not possible to have both consistency, availability and partition tolerance in a distributed system ● Implement a simple server ● Explain the difference between a stateful and stateless service ● Understand the problems of scaling up ● Know the principles of a service-oriented architecture	
Evaluation method Continuous monitoring	
Responsible François CHAROY	***Hourly volume:*** 30 hours (14h CM, 16h TD) + 15 hours project

NoSQL database	
Teaching unit STIC 9	***ECTS credits*** 3
Objectives Giving students a basic understanding of the NoSQL ecosystem and the characteristics of the solutions on the market (ElasticSearch, Cassandra, MongoDB, Redis, Neo4j, etc.).	
Training achievements ● Understand how the main NoSQL solutions work ● Design and develop an application that manipulates a NoSQL database ● Understand some distributed systems concepts such as consistency and the CAP theorem.	
Evaluation method Terminal test	
Responsible Sabeur ARIDHI	***Hourly volume:*** 44 hours (10h CM, 2h TD, 32h TP)

Artificial Intelligence and Cobotics	
Teaching unit STIC 9	***ECTS credits*** 2
Objectives 4-day workshop where we dive into the world of Artificial Intelligence (AI) and Cobotics. This workshop is designed to provide students with a comprehensive understanding of AI principles and its integration of collaborative robots (cobots). Through hands-on sessions, interactive discussions, and real-world applications at the AIPL industry 4.0 workshop, participants will explore the latest advancements in AI technology, learn about the synergy between humans and cobots, and develop practical skills to tackle future challenges in the field.	
Training achievements ● Understanding AI and Cobotics Fundamentals ● Hands-On Experience with AI Tools and Technologies ● Exploring Real-World Applications ● Developing Problem-Solving and Collaboration Skills ● Preparing for understanding how the industrial information systems contribute in AI and Cobotics	
Evaluation method Terminal test	
Responsible Hervé PANETTO	***Hourly volume:*** 24 hours (24h TD)

Business Intelligence	
Teaching unit STIC 9	***ECTS credits*** 2
Objectives To present the techniques used to design business intelligence databases, the sole aim of which is to render information while prioritising response times and data accessibility.	
Training achievements ● Understanding the principles of BI (Business Intelligence) ● Developing generic interfaces for data collection ● Implementing a data warehouse ● Develop decision support tools from a mass of heterogeneous data ● Apply algorithms to implement data mining processes	
Evaluation metod Terminal test	
Responsible Hervé PANETTO	***Hourly volume:*** 38 hours (8h CM, 10h TD, 20h TP) + 10 hours project

Enterprise applications interoperability

Teaching unit	***ECTS credits***
STIC 9	2

Objectives

- Train students to manage a project to implement integrated management and production control software packages covering the analysis and development phases enabling business applications to interface with all the information from the various production processes in a B2M (Business to Manufacturing) context.
- Study EAI, SOAP, B2MML integration technologies and model-based architectures (MDE, OMG MDA, IS) and their implementation to ensure model and data interoperability between enterprise applications.

Training achievements

- Meta-modelling a modelling language to understand its foundations
- Express functional constraints and analyse their intrinsic consistency
- Analyse the semantics of data models
- Define semantic correspondences relating to the exchange of data between several information systems
- Apply an MBSE (Model-Based Systems Engineering) approach to identify multi-model, multi-trade relationships in the specification of a complex system to be developed

Evaluation method
Terminal test

Responsible	***Hourly volume:***
Hervé PANETTO	42 hours (10h CM, 12h TD, 20h TP) + 20 hours project