ESIGELEC
SCHOOL OF ENGINEERING
SMART AND CONNECTED SYSTEMS

BIENVENUE EN FRANCE

EXCHANGE PROGRAM

COURSE OUTLINE
Semester 1 (September - January)

SOFTWARE ENGINEERING & DIGITAL TRANSFORMATION (ENGLISH-TAUGHT)

ACADEMIC YEAR - 2023-2024

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THE EXCHANGE PROGRAM

A student exchange program is one that you will undertake during the course of study that you are already pursuing. This study period in another university abroad will allow you to leverage and enhance your skills in an international environment.

Course delivery will almost definitely differ from what you are used to in your university, it is therefore important that you take a close look at this course outline, in order that you understand what to expect during the semester / year at ESIGELEC. We encourage you to pay attention to the information provided to you on each module and to go through all the other points this document covers, like attendance, evaluation, support services, etc.

This document is key to making your experience at ESIGELEC a successful one.

A SEMESTER 1 (SEPTEMBER - JANUARY)

SNAPSHOT – COURSES, MODULES, DURATION, WEIGHT & ECTS CREDITS

30 CREDITS / 354 HOURS				
Courses	**Weight**	**Modules**	**Duration (hours)**	**ECTS Credits**
Computer Science 1	3	Introduction to Object Oriented Programming with Java	40	8
	2	Fundamentals of Data Communication and Networking	24	
	3	Fundamentals of Web-Centric Development	30	
Digital Electronics	3	Binary Logic & Digital Functions	30	9
	3	LabView	30	
	3	C Programming	30	
Communication & Language	3	Cross Cultural Awareness and Working in a Team	36	6
	3	French as a Foreign Language OR English as a Foreign Language	60	
Specialized Courses for SEDT	4	Java Project	50	7
	3	Database Management Systems	24	
Total Credits				**30**

All modules are delivered face-to-face, on campus, with all required safety measures. However, modules may be delivered partially or totally online and/or through distance mode.

B COURSE CURRICULUM & SYLLABUS

Introduction to Object-Oriented Programming with JAVA

Module Code: MSTSI12 **Duration: 40h**

Objectives

At the end of this module students will be able to:

- Write, test and set up a Java programme and documentation from a given situation
- Use vocabulary relating to OO languages within the framework of Java
- Explain the design and set up for the life-cycle of a Java programme / explain the design
- Process and working of a Java program (define bytecode and explain the role of a JVM)
- Document code and create the Javadoc
- Respect Java writing code structures
- Use existing classes and packages
- Use basic Eclipse functions: editing, compiling, operating, importing and debugging

List of topics

- Storing information, communicating information, making choices, creating repetitions
- Initiation to Object-Oriented programming
- From algorithms to writing functions, classes and objects, UML classes
- Collecting objects (a fixed amount and undetermined amount), using UML

Fundamentals of Data Communication & Networking

Module Code: MSTSI11 Duration: 24h

Objectives

At the end of this module students will be able to:

- Understand the very basic operation of communication networks
- Distinguish between different communication technologies
- Distinguish between different communication services
- Choose communication technologies and services appropriate for given requirements
- Get a better understanding of the Internet communication services they use in everyday life

List of topics

- Basics of information transmission
- Classical telecommunications services
- Integration of telecommunication services
- Principles of networking and protocols
- TCP/IP communication architecture
- LAN/WLAN technologies
- MobilityFundamentals of Web-centric Development

Fundamentals of Web-Centric Development

Module Code: MSTSI14 Duration: 30h

Objectives

At the end of this module students will be able to explain:

- How the web relates to the Internet
- What HTTP is
- The notions of web server and web client
- The role of PHP, HTML,CSS, Javascript languages
- The major steps of a web project implementation
- The value of validation for web site security

The student will also be able to create a Web site which:

- Is dynamic
- Follows the separation of content and presentation principle
- Is in keeping with HTML5 and CSS standards
- Is secured against SQL injections and defacement attacks
- Is in project mode, using especially the Git version control system

List of topics

- Introduction to the internet and World Wide Web
- HTML (Hypertext Markup Language)
- Editing and viewing HTML
- Headers, titles, meta-tags
- Special characters
- Lists
- Tables
- Basic forms
- Metatags
- Cascading Style Sheets
- Embedded Anchors, Images, Links, Objects
- Dynamic web pages with PHP
- Introduction to javascript

Binary Logic & Digital Functions

Module Code: MSTEE11 **Duration: 30h**

Objectives

At the end of this module, students will be able to: analyse and design digital functions

List of topics

- Basic concepts of probability:
- Number representation
- Fundamentals of Boolean algebra
- Construction of elementary gates
- Circuits developed from combinatory logic (comparator, decoder and demultiplexer)
- Introduction to sequential logic and its basic components (D, RS, RSH, and JK flip flop circuits)
- Registers and counters
- Designing and creating a sequential system

LabView

Module Code: MSTEE15 **Duration: 30h**

Objectives

At the end of this module students will be able to:

- Design a program with LabVIEW for an electrocardiogram that monitors real and “noisy” data. This program must:
- Respect design standards
- Use standard programming and signal processing tools seen in the 2nd year
- The application must respect standard LabVIEW practices (taken from the Certified LabVIEW Developer (CLD) test) and use a modular and evolving architecture

List of topics

- Fundamental programming notions in LabVIEW
- LabVIEW programming
- Creating an interface
- Learning good LabVIEW practices for form and structure in programming

C Programming

Module Code: MSTEE10 Duration: 30h

Objectives

At the end of this module, students will be able to write and develop a programme in C language, using:

- Functions: definitions, interests, prototypes
- 1 & 2 D arrays: syntax, use, parameters
- String functions: manipulating chains of characters
- Pointers: syntax, manipulation, using them correctly
- Structures: syntax, manipulation, establishing parameters
- Binary and text files: manipulation and relation to structures
- Dynamic allocation
- Circuits developed from combinatory logic (comparator, decoder and demultiplexer)
- Introduction to sequential logic and its basic components (D, RS, RSH, and JK flip flop circuits)
- Registers and counters
- Designing and creating a sequential system

Cross Cultural Awareness & Working in a Team

Module Code: MSTCCAWT **Duration: 36h**

Objectives

At the end of this module students will be able to:

- Recognise the different elements that make up culture
- Demonstrate the role culture plays on general and professional communication and behaviour
- Suggest ways to begin respecting and reconciling the cultural differences that make a difference
- Analyse the cultural elements inherent in different situations
- Evaluate the relative importance of different cultural elements in different communication situations
- Apply different cultural orientations to correctly analyse different situations
- Interact more sensitively within international teams
- Develop a capacity for culturally sensitive critical analysis
- Sensitively interpret different elements of verbal and non-verbal communication
- Sensitively analyse critical incidents
- Clearly distinguish between objective and subjective culture
- Integrate a new team from an initial team

List of topics

- Modern leadership models and their application
- The influence of national cultures on leadership
- The building and management of international, multidiscipline, remote and virtual teams

French as a Foreign Language

Module Code: MSTFRE1 **Duration: 60h**

Objectives

At the end of this module students will be able to:

- Oral comprehension
  - Understand standard French used in everyday situations at work, school, etc.
- Written comprehension
  - Understand texts written in standard French used in everyday situations such at work, school, etc.
- Oral expression
  - Participate in a regular day-to-day conversation on familiar topics
  - Ask and exchange information
  - Prepare and give a short formal presentation
- Written expression
  - Write short, clear and coherent texts on familiar/everyday situations with basic grammar and vocabulary

List of topics

- Revision of grammar and vocabulary
- Preparation for the Test of French Language (TCF or TEF)

English as a Foreign Language

Module Code: MSTENG1 **Duration: 60h**

Objectives

At the end of this module students will be able to:

- Oral comprehension
  - Understand standard English used in everyday situations at work, school, etc.
- Written comprehension
  - Understand texts written in standard English used in everyday situations such at work, school, etc.
- Oral expression
  - Participate in a regular day-to-day conversation on familiar topics
  - Ask and exchange information
  - Prepare and give a short formal presentation
- Written expression
  - Write short, clear and coherent texts on familiar / everyday situations with basic grammar and vocabulary

List of topics

- Revision of grammar and vocabulary
- Preparation for the Test of English for International Communication (TOEIC)

Java Project

Module Code: MSTSI40 Duration: 50h

Objectives

At the end of this module students will be able to:

- Familiarise themselves with real-world situations similar to that of future professional environments
- Acquire skills to exercise their initiative and independence
- Improve their organizational, interpersonal and communication skills
- Acquire time management skills

List of topics

- Designing a product
- Product testing

Database Management Systems

Module Code: MSTSI13 Duration: 24h

Objectives

At the end of this module students will be:

- Familiar with data modeling concepts (E/R and UML Class diagrams) used in database development
- Able to create databases and pose complex SQL queries of relational databases
- Able to develop an appreciation and familiarity in the use of DBMS's (ORACLE)

List of topics

- Introduction to databases
- Modelling using E/R and UML class diagrams
- Normal forms
- Relational algebra
- Embedded SQL (overview)
- SQL and optimization

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ESIGELEC, Technopôle du Madrillet, Avenue Galilée BP10024,
76801 Saint-Etienne du Rouvray - CEDEX France
Phone: +33 (0)2 32 91 58 58 | www.esigelec.fr

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