EXCHANGE PROGRAM

COURSE OUTLINE 2024
Semester 3 (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.

SEMESTER 3: 30 CREDITS / 336 HOURS				
Courses	**Weight**	**Modules**	**Duration (hours)**	**ECTS Credits**
Information Systems	2	Cloud Computing	30	10
	3	Information Systems & Organizations	20	
	3	Information System Security	30	
	2	Web-centric Development & ASP.NET	20	
Business Management	3	Management Control & Business	32	7
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	1	Intellectual Property & Internet Protection Laws	12	
Project Development & Management	2	Project management	30	9
	7	R & D Project	80	
Foreign Language	4	French as a Foreign Language OR English as a Foreign Language	60	4
Total Credits				30
Semester 4: Internship of 4 to 6 months				

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

Cloud Computing
Module Code: MSTSI31   Duration: 30h

Objectives
At the end of this module students will:
- Be familiar with fundamental cloud computing topics, in relation with both technology and business considerations
- Be able to develop a web project using the Google Cloud platform (PaaS cloud model)

List of topics
- Fundamental cloud computing terminology and concepts
- Basics of virtualization
- Specific characteristics that define a cloud
- Software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS)
- Cloud delivery models
- Create and deploy the first application on the Google cloud platform
- Saving the data into the cloud
- Google cloud SQL service
- Google cloud data store service
- Exploiting the data store using Objectify
- Google blob store service (special case of Google storage service)
- Google account API

Information Systems & Organizations
Module Code: MSTSI32   Duration: 20h

Objectives

At the end of this module students will be able to develop an under-standing of the complex relationship between technical knowledge and business practice.

List of topics
- The value of IT
- IT strategic alignment
- IT and customer interaction
- IT and the value chain / integration / collaboration
- IT and organizational change (adoption / acceptance / appropriation of IT)
- IT switching costs, network effects and technology lock-in
- IT and society
- Knowledge management and collective intelligence

Information System Security
Module Code: MSTSI33   Duration: 30h

Objectives

At the end of this module students will:
- Be familiar with technologies used to maintain and develop the security of the information systems in companies
- Be familiar with some guidelines and examples regarding security policies in companies

List of topics
- ○ Overview on cryptography
  - · Substitution ciphers, one-time-pads, stream ciphers, block ciphers
  - · Public key cryptography, one-way hash-functions, digital signatures
  - · PGP, SSL
- ○ Internet and IP security
  - · E-Mail, MIME-types, active content security (including e.g. viruses, trojan horses, worms, phishing, social engineering)
  - · VoIP, WLAN
  - · Firewalls
  - · Packet filter, application gateways, web application firewalls
  - · Firewall topologies
  - · Intrusion detection

Web-centric Development and ASP.NET
Module Code: MSTSI34   Duration: 20h

Objectives

At the end of this module students will be able to:
- ○ Gain a thorough understanding of the philosophy and architecture of web applications using ASP.NET
- ○ Acquire a working knowledge of web application development using web forms and visual studio
- ○ Optimize an ASP.NET web application using configuration, security, and caching
- ○ Access databases using ADO.NET and LINQ
- ○ Implement rich client applications using ASP.NET AJAX
- ○ Customize web applications through the use of HTTP handlers and modules

List of topics
- ○ Presentation of web applications using ASP.NET
- ○ Development of web applications using ASP. NET
- ○ Notions of optimization and customization of web applications

Management Control and Business
Module Code: MSTSI35   Duration: 32h

Objectives

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

- Acquire the fundamentals of accounting (introduction to general accounting and financial statements)
- Have an understanding of the methods and systems used by managers to achieve their objectives of planning, controlling and decision making.
- Develop analytical skills
- Develop problem-solving skills including understanding all financial and qualitative Implications of business decisions
- Define different types of organizations, their objectives and the manager's need for information
- Recognize cost behaviour patterns
- Perform cost-volume-profit and breakeven analysis
- Calculate inventory valuation under the direct cost concept, evaluate cost variances, prepare flexible budgets
- Define responsibility accounting

List of topics

- Daily operations
- Income statements
- Inventory, inventory valuation methods
- Accounting management tools
- Management / cost accounting
- The financial statements
- Decision making
- Managerial accounting and the business organization
- Cost behaviour / cost-volume relationship

Marketing in a Technical Environment
Module Code: MSTSI36   Duration: 22h

Objective

At the end of this module students will:

- Be familiar with issues in new product development
- Be familiar with marketing concepts
- Be familiar with marketing strategies used in new product development
- Be able to describe the Stage-Gate model of NPD
- Understand the use of Nagel's Pricing Pyramid

List of topics

- Market research methods
- Market segmentation
- Product positioning (4 Ps)
- Price elasticity
- Cross functional integration
- The champion role
- Business intelligence
- Cross-cultural issues in marketing
- 'Start-Up!' simulation that demonstrates marketing issues in NPD
- Brand Management and the role of advertising
- Market Orientation and Market Myopia

Intellectual Property & Internet Protection Laws
Module Code: MSTSI37   Duration: 12h

Objectives

At the end of this module students will:
- Be familiar with constraints of laws
- Be familiar with the French National Commission in charge of Privacy Protection, how it works and what its powers are
- Be aware of the responsibilities of everybody inside an organization
- Be aware of the responsibility of the internet user, regarding in particularly the intellectual property

List of topics
- Intellectual property (IP) laws (Trademarks, Patents, Copyright, Domain Names & Design) that can be used / displayed on the Internet
- Internet & web laws
- IP infringements on the Internet
- E-commerce, e-contracts, such as general terms of use and general conditions of sale, licence contracts
- Internet user duties and rights
- Web hosting provider duties and liability
- Personal date protection in particularly in companies and on social networks
- Privacy Protection

Project Management
Module Code: MSTPM   Duration: 30h

Objectives

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

- Appreciate the need for project management including formal methods, as a recognised discipline
- Appreciate the need for effective planning, control and delivery mechanisms
- Understand the complexities of different types of computing projects and some of the methods used to manage them
- Apply some of the skills and knowledge learned in any future project (including during other module(s) of this course, and, in particular, documentation for development project)

List of topics

- What is a project? The need for PM, formal methods
- Managing large, complex, international projects
- Un peu de franglais (PM culture & language in English & French)
- Management of projects, project life cycle, roles of the project manager and stakeholders
- Stakeholder management, scope, creep
- Work planning, project breakdown structures and estimating
- Resource planning, estimating, management
- Risk identification, analysis, management
- PERT and Gantt charts, their use and shortcomings
- PM planning tools (including practical sessions with MS Project)
- Change control, documentation, configuration management
- Project control, quality, documentation, delivery management
- Project closure; maintenance projects
- Types of computing projects and risks; computing PM methods
- Cost-benefit analysis and project accounting may be touched upon, but are not in the scope of this course

Research & Development Project
Module Code: MSTSI38   Duration: 80h

Objectives

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

- Improve their organizational skills (within a team, facing deadlines) and manage their time
- Improve their communication skills
- Work in a real-world situation close to their future professional environments
- Filter and identify relevant online information according to a targeted subject
- Constitute a bibliographical study
- Develop functional specifications and success strategies
- Estimate the workload of each identified task
- Analyse their production capacity
- Design and build computer applications with current standards and new opportunities
- Integrate research approaches
- Evaluate the quality level for a developed application
- Present their work and justify the outcome

List of topics

- State of the art practices
- Technical / feasibility studies
- Research methodologies and approaches
- Information processing
- Experimental results and evaluation

French as a Foreign Language
Module Code: MSTFRE3   **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: MSTENG3   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)

Note: The programme can be modified in keeping with the faculty member's prerogatives or organizational constraints.