

MASTER IN SCIENCES AND TECHNOLOGY

INFORMATION SYSTEMS

COURSE OUTLINE AND GUIDELINES

Academic Year 2015-2016

In partnership with

INSA | INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
ROUEN

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COURSE STRUCTURE

The Master's Programme comprises:

For students with a 4-year Bachelor's Degree minimum and with a specialisation in Information Technology/ Computer Science/ Information Science/ Communication Engineering AND having been granted direct admission into the second semester by ESIGELEC:

Semester 2 – Academic (on campus)
 Semester 3 – Academic (on campus)
 Semester 4 – Internship (company/laboratory)

For students with a 3-year Bachelor's Degree OR with a 4-year Bachelor's Degree in another engineering stream OR having been refused admission to the second semester:

Semester 1 – Academic (on campus)
 Semester 2 – Academic (on campus)
 Semester 3 – Academic (on campus)
 Semester 4 – Internship (company/laboratory)

The first three academic semesters* are offered between February 2015 and July 2016. Lectures, tutorials, lab work, practical work, projects, conferences and/or seminars make up the academic semesters. Evaluation, in the form of tests, quizzes, exams, etc. is conducted on a regular basis. Faculty members are from ESIGELEC and/or INSA Rouen, from partner companies and from partner universities in France or abroad.

** (2 semesters in the case of students granted direct entry into the second semester, beginning September 2015)*

The final semester is devoted to industrial or research experience, during which students must do a mandatory internship in a company or laboratory for a period of 4 months (min.) to 6 months (max.). While ESIGELEC and/or INSA Rouen provide assistance to find internships, students are expected to play an active part, as internships are not offered automatically. The students have up to a maximum of two years, after the final academic semester:

- to find and complete the internship
- to submit a professional thesis and make an oral presentation before a convened jury

Failure to meet these requirements may result in the degree not being awarded.

The Student Status

Registered Student status & Enrolled Student status

The final semester comprises three stages, i.e. completing the internship, submitting the professional thesis and the oral presentation before a jury convened by ESIGELEC.

Students are considered *Registered Students* of ESIGELEC for a period of 6 months after the end of the last academic semester. During this time, students are expected to complete the three aforesaid stages. The *Registered Student* status will be extended if a student has started the internship but has not completed second/third stage. The *Registered Student* and the *Enrolled Student* status will cease to apply irrespective of whether or not the student has been awarded the Master's Degree by the jury of ESIGELEC and INSA Rouen, upon completion of the course.

B

In the case of students not starting the internship in the six months following the end of the final academic semester, they will have to re-enrol and will be considered *Enrolled Students of ESIGELEC*. The *Registered Student* status will take effect again upon commencement of the internship and remain valid until such time the student has completed all three stages therein involved.

A student has a maximum period of two years to complete the three stages of the internship semester. The students' personal insurance must be valid for the entire period wherein he/she is considered a Registered Student or an Enrolled Student.

Also refer Internship section.

PROGRAMME OBJECTIVES

The Master's Programme seeks to equip the students with the relevant knowledge, professional skills and practical experience in Information Systems for industry or for research. They will learn how to design, develop and implement information systems in different sectors. Students will also acquire basic managerial skills.

The international environment at ESIGELEC allows students to discover new cultures and languages. Students must appear for the TCF/TEF certification exams in French (or TOEIC for French speaking students). The mandatory internship gives the students a hands-on experience in the work environment. Our graduates find job opportunities as developers, project managers, consultants or researchers in the field of information systems.

C

ATTENDANCE POLICY

ESIGELEC views class attendance as the student's individual responsibility. Students are expected to comply with ESIGELEC's attendance policy throughout their study period. All lectures, tutorials, practical work, projects, conferences and seminars are mandatory. Attendance will be monitored by the faculty members at the beginning of each class and the attendance sheet will be maintained by the Studies Office of ESIGELEC.

Late entry into class:

If a student is late by 10 or more minutes, he/she will be refused entry into the classroom and the faculty member will make a note in the attendance register.

Absence from class:

A student who is absent for medical reasons must submit a medical certificate within 3 working days, in order for the absence to be excused.

Leave letters in the case of other accepted anticipated absences must be signed at least 8 days prior to the absence, by the Academic Coordinator of the Master's Programme, in order for the absence to be excused.

No other justifications of absence will be excused by ESIGELEC.

D

Penalty

Students will receive an oral warning after 5 occurrences (late entry or unjustified absence). A stern oral warning will be given after 10 instances. 20 such cases may lead to the student's dismissal from ESIGELEC.

Absence from examination:

- Only students whose absence from an examination has been excused will be allowed to re-take an examination.
- Students whose absence from an examination has not been excused will be marked 0/20 in the said examination.

EVALUATION

Evaluation may include tests, quizzes, presentations or other formats as decided by the faculty members, who may also authorise the use of reference documents or calculators, if they deem it necessary. Each such test will be graded on a maximum mark of 20.

Scores & ECTS credits (European Credit Transfer System)

- The Master's Programme is divided into several weighted courses, all of which include one or more weighted modules. Each course represents a certain number of credits.
- The score of a module is the average of the weighted scores of the different evaluation processes conducted within the same module.
- The score of a course is the result of the weighted averages of all modules of the course.
- The final overall score of the student is the result of the weighted averages of all courses of the Master's Programme.
- The total number of ECTS credits of the Master's Programme is equal to the total of all the ECTS credits of its courses.
- One ECTS credit corresponds to about 25 hours of course work (lectures, tutorials, lab work, projects, practical work, evaluation, individual work).
- Students who are granted entry directly to the second semester, beginning September 2015, will automatically be awarded 30 ECTS credits, equivalent to the first semester of the Master's Programme.
- A statement of marks is sent to the students at the end of each academic semester and also after they are evaluated by the Jury of ESIGELEC and INSA Rouen.

E

FRAUD AND CHEATING

Students indulging in fraudulent practices/ cheating during an exam/ oral presentation/ project/ practical work will be marked 0/20 for that piece of course work, evaluation exercise or exam.

Examples of plagiarism, fraud or cheating, include, but are not limited to:

- Duplication of another student's work during a written assignment / exam;
- Use of a reference document or calculator not authorized by the faculty member during an evaluation exercise.
- Plagiarism (>20%) of reports, presentations, or computing programs, obtained by any means (book, magazine, other students, electronic files, Internet, work previously submitted in another course).

F

AWARDING THE MASTER'S DEGREE

Each academic semester at ESIGELEC carries a total of 30 ECTS credits. The internship, professional thesis and oral presentation also carry a total of 30 ECTS credits. A student must obtain a minimum score of 10/20 in a course to be awarded the allocated ECTS credits of the course.

The Master's Degree is awarded if the student has obtained a minimum average score of 10/20 in each course, thereby obtaining the total number of 120 credits.

The jury of ESIGELEC and INSA Rouen for the Master's Degree comprises the President, the Academic Coordinator of the Master's Programme, faculty members of ESIGELEC and/or INSA Rouen, and representatives of the managing staff of ESIGELEC and/or INSA Rouen. This jury, chosen by the General Director of ESIGELEC, convenes up to a maximum of four times per year, i.e. April, July, September and December.

If students do not obtain the requisite number of ECTS credits in order to be awarded the Master's Degree, even after re-taking exams, they will receive only an attestation from ESIGELEC and INSA Rouen, mentioning the total number of ECTS credits obtained in the different courses in which they have obtained a minimum score of 10/20.

The Master in Sciences and Technology - Information Systems, awarded by ESIGELEC and INSA Rouen to the successful students, is accredited by the French Ministry of Higher Education and Research.

G

RETAKE EXAMS

If a student has obtained less than 10/20 in one or more courses in the academic semesters at ESIGELEC, the student will be asked to retake one or more exams in one or more modules of the courses concerned, as advised by the Academic Coordinator of the Master's Programme (even if the final overall score of the student in the Master's Programme is greater than 10/20).

If a student does not obtain the 30 ECTS credits in the final semester (internship), the Academic Coordinator of the Master's Programme may:

- Instruct the student to redo a new internship, including submission of a professional thesis and an oral presentation, or;
- Instruct the student to submit a fresh report and/or redo the oral presentation, or;
- Deny the award of 30 ECTS credits, on the grounds of misconduct during the internship.

The scores obtained from exams retaken replace the previous scores obtained by the student in the modules concerned and a new average score will be calculated for the course(s) concerned.

If the student does not retake an exam as advised by the Academic Coordinator, the student will be marked 0/20 for the module.

The new average of the courses must be greater than 10/20 in order to obtain the requisite credits.

COURSES AND ECTS CREDITS

COURSES	CODE	MODULES	DURATION (HOURS)	WEIGHT	ECTS CREDITS
SEMESTER 1 FEB 2015 - JUNE 2015					
Computer Science 1	MSTIS01	Operating Systems and System Programming	20	2	13
	MSTIS02	Introduction to Object Oriented Programming with JAVA	40	5	
	MSTIS03	Introduction to C Programming	25	3	
	MSTIS04	Internet	25	3	
Business Analysis	MSTIS05	Project Organisation	15	1	5
	MSTIS06	Financial Analysis	20	2	
	MSTIS07	General Accounting	20	2	
Project	MSTMP	Minor Project	60	6	6
Foreign Languages (2 options)	MSTFRE1	French as a Foreign Language	60	6	6
	MSTENG1	English as a Foreign Language			
TOTAL - SEMESTER 1			285	30	30
SEMESTER 2 SEPT 2015 - JAN 2016					
Computer Science 2	MSTIS11	Fundamentals of Web-Centric Development	24	3	12
	MSTIS12	Object-Oriented Programming with JAVA	30	3	
	MSTIS13	Database Management Systems	24	2	
	MSTIS14	Introduction to .NET Framework (C#)	20	2	
	MSTIS15	Fundamentals of Data Communication and Networking	24	2	
Business Intelligence	MSTIS16	Introduction to Business Intelligence	20	2	8
	MSTIS17	Data Bases Programming with PL SQL	20	2	
	MSTIS18	Introduction to a BI Tool	20	2	
	MSTIS19	Data Mining	20	2	
Project Management	MSTCCAWT	Cross Cultural Awareness/ Working in a Team	36	3	6
	MSTOCC	Oral Communication and Coaching	14	1	
	MSTIS1A	Analysis and Design with UML	32	2	
Foreign Languages (2 options)	MSTFRE2	French as a Foreign Language	30	4	4
	MSTENG2	English as a Foreign Language			
TOTAL - SEMESTER 2			314	30	30
SEMESTER 3 FEB 2016 - JULY 2016					
Information Systems	MSTIS20	Advanced Java Programming	20	2	14
	MSTIS21	Cloud Computing	20	2	
	MSTIS22	JSP and Servlets	20	2	
	MSTIS23	Information Systems and Companies	32	3	
	MSTIS24	Information System Security	32	3	
	MSTIS25	Webcentric Development and ASP . NET	20	2	
Business Management	MSTIS26	Management Control and Business	32	2	5
	MSTIS27	Marketing in a Technical Environment	32	2	
	MSTIS28	Law & Internet, Privacy Protection	12	1	
Project Development & Management	MSTPM	Project Management	26	2	7
	MSTPRO	Project Development	80	5	
Foreign Language (2 options)	MSTFRE3	French as a Foreign Language	40	4	4
	MSTENG3	English as a Foreign Language			
TOTAL - SEMESTER 3			366	30	30
SEMESTER 4 - Internship					
	MSTINT	July 2016 -	4-6 months		30



Module Code:
MSTIS01
Duration: 20h

Module Code:
MSTIS02
Duration: 40h

COURSE CURRICULUM AND SYLLABUS

Module

Operating Systems and System Programming

Objectives

At the end of this module, students will:

- Be able to describe the key elements and architecture of an operating systems
- Know how an operating system functions
- Know how to use the principle Linux instructions and write simple shell scripts
- Understand and design an application enabling inter-process communication

List of topics

- Processes and multithreading
 - File and memory systems
 - Linux instructions
 - Inter-process programming
 - Inter-process communication
-

Module

Introduction to Object-Oriented Programming with JAVA

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

** This course will also help students to improve their team-work skills and their understanding of technical documents*

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

Module Code:
MSTIS03
Duration: 25h

Module
Introduction to C Programming

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

List of topics:

- Algorithms, processors, fundamentals, environment and variables
- Simplified architecture of a computer
- C Language: programming structure, declarations, control structures (if, switch, while, do while, for), entries / exits (printf, scanf, fflush role)
- Environment for development
- 1D arrays
- Review of general notions for arrays, functions, character chains, structures, pointers, dynamic allocation, files

Module Code:
MSTIS04
Duration: 25h

Module
Internet

Objectives

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

- Use web-oriented languages for client-server functions

List of topics

- HTML, XHTML
- JavaScript
- XML (eXensible Markup Language)
- CSS (Cascading Style Sheets)
- PHP (Personal Home Page)

Module Code:
MSTIS05
Duration: 15h

Module
Project Organisation

Objectives

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

- Develop organizational skills and general methodology for managing projects
- Know how to envision and adapt to various professional situations using real-world examples from industry

Module Code:
MSTIS06
Duration: 20h

List of topics

- Studying the methods and tools used to manage projects
 - Modern and innovative professional management practices
 - The study of good practices and commonly accepted practices
 - The management of complex inter-relations between players
 - Understanding the different types of projects and contracts
-

Module **Financial Analysis**

Objectives

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

- Acquire the fundamentals of financial analysis

List of topics

- Outcome equilibrium
 - Analyzing fluctuations
 - The financial statement
-

Module Code:
MSTIS07
Duration: 20h

Module **General Accounting**

Objectives

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

- Acquire the fundamentals of accounting

List of topics

- Daily operations
 - Income statements
 - Inventory
 - Accounting management tools
 - Management / cost accounting
-

Module Code:
MSTMP
Duration: 60h

Module **Minor Project**

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
- Learn to manage time

Module Code:
MSTENG1
MSTENG2
MSTENG3
Duration: 130h

List of topics

- Designing a product
 - Product testing
-

Module **English as a Foreign Language**

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 as 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 presentationWritten 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)
-

Module Code:
MSTFRE1
MSTFRE2
MSTFRE3
Duration: 130 hours

Module **French as a Foreign Language**

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 as 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 presentationWritten 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)

Module Code:
MSTIS11
Duration: 24h

Module
Fundamentals of Web-centric Development

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 be able to create a website which:

- Is dynamic
- Follows the separation of content and presentation principle
- Is valid according to HTML5 and CSS w3c 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
 - Framsets
 - Style sheets
 - Embedded Anchors, Images, Links, Objects
 - Introduction to javascript
-

Module Code:
MSTIS12
Duration: 30h

Module
Object-oriented Programming with JAVA

Objectives

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

- Develop programmes using object-oriented programming with Java

List of topics

- Introduction to object orientation
- Introduction to Java
- Language structure
- Java class - a new concept
- Garbage collection - Java way

Module Code:
MSTIS13
Duration: 24h

- Access modifiers
 - Inner classes
 - Inheritance
 - Packages and interfaces
 - Exception handling
 - File I/O in Java
 - Swing GUI
-

Module
Database Management Systems

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
-

Module Code:
MSTIS14
Duration: 20h

Module
Introduction to .NET Framework

Objectives

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

- What the .NET framework is
- The .NET-specific vocabulary
- Which languages are available and when to use them
- The role of the ILAsm assembly language
- The strengths and weaknesses of C#/.NET and how they compare to JAVA and the JVM
- What LINQ is and when it should be used

Students will be able to:

- Write a simple ILAsm programmes using a simple text editor
- Compile and decompile a .NET programmes written in IALSM and C# using the command line
- Write C# programmes using the Visual Studio platform
- Manipulate data using the .NET framework components
- Use the MSDN documentation and the <http://www.codeproject.com> resource

Module Code:
MSTIS15
Duration: 24h

List of topics

- .NET, an improved JVM ? Practical on ILAsm.
- From Eclipse/JAVA to Visual Studio/C#
- Data retrieval and manipulation using .Net components
- Advanced data manipulation with LINQ

Module

Fundamentals of Data Communication and Networking

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
- Mobility
- Service integration and mobility

Module Code:
MSTIS16
Duration: 20h

Module

Introduction to Business Intelligence

Objectives

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

- Understand what business intelligence means and how it works

List of topics

- Evolution of decision support systems
- The data warehouse environment
- The data warehouse characteristics
- Structuring data in the data Warehouse
- Data homogeneity and heterogeneity
- Techniques for scanning the data
- The data warehouse and data models
- The data warehouse data model
- Techniques for implementing the data warehouse
- The star schema
- Steps for the design and construction of the data warehouse
- Types of OLAP servers: ROLAP vs. MOLAP vs. HOLAP
- Efficient computation of data cubes
- Indexing OLAP data

Module Code:
MSTIS17
Duration: 20h

Module
Data Bases Programming with PL SQL

Objectives

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

- Use PL/SQL language to develop programmes for data bases

List of topics

- PL/SQL language components: data types, definition/declaration, assignment, operator, tests, cursors, program structure, comments
 - Loops, records, functions, procedures, fetching data from server, built-in functions
 - Exceptions, error handling
 - Controlling the data with triggers and alerts, control of triggers
-

Module Code:
MSTIS18
Duration: 20h

Module
Introduction to a BI tool

Objective

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

- Use a BI tool to design universes, and produce reports from a data warehouse

List of topics

- Example of a BI tool
 - How to use a BI tool to design a universe
 - How to use a BI tool to produce reports from a data warehouse
-

Module Code:
MSTIS19
Duration: 20h

Module
Data Mining

Objective

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

- Define, know the role, use and put into practice data mining

List of topics

- Introduction to data mining
 - Why data mining?
 - What is data mining?
 - Overview of the KDD process
 - Problems and techniques
 - Data mining applications
 - Concepts, instances, attributes
 - Knowledge representations
- Data mining algorithms (1)
 - Introduction to Weka
 - One-R
 - Naïve Bayes Classifier
 - Bayesian methods

Module Code:
MSTCCAWT
Duration: 36h

- Data mining algorithms (2)
 - Information gain
 - Decision tree learning
 - Decision rules
 - Association-rule mining methods
 - K-nearest neighbour classifiers
- Evaluating data mining results
 - Issues in evaluation
 - Training and testing principles
 - Error measures, holdout, cross validation
 - Comparing algorithms
 - Taking costs into account
 - Trade-offs in the confusion matrix
 - Challenges in data mining

Module

Cross Cultural Awareness/ Working in a Team

Objectives

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

- Understand the changing views and theories of leadership in history
- Understand the dynamics and roles of people in teams
- Understand the impact of different cultures on management styles
- Apply leadership theory in all aspects of life
- Use a range of tools / reminder management systems to facilitate good leadership

List of topics

- Modern leadership models and their application
- Maslow's hierarchy of needs and its role in management
- The J Adair model and its use in work and in the student environment
- Belbin team roles, student participation in the "test". The use of Belbin roles in student and work situations
- The need for communication in leadership - business game to illustrate the difficulties of leadership
- The influence of national cultures on leadership
- The building and management of international, multi-discipline, remote and virtual teams

Module Code:
MSTOCC
Duration: 14h

Module

Oral Communication and Coaching

Objectives

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

- Practice their use of the English language in the context of oral presentations which they will be required to produce, for instance, at the end of the integration project and for the professional thesis

Module Code:
MSTIS1A
Duration: 32h

List of topics

- Methods used to prepare an oral presentation.
 - Simulations
-

Module

Analysis and Design with UML

Objectives

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

- Be familiar with the process for designing software applications, with a special focus on the Unified Modeling Language (UML) and Java as design tools
- Be familiar with the major steps in software design, including the development of user requirements, specifications, data bases, user interfaces, and software models

List of topics

- Overview of software design: challenges, accomplishments, and failures
 - Overview of software lifecycle model and its variants
 - Overview of object oriented design – Java classes, objects, inheritance, associations
 - Requirements analysis and use case design – UML use case and sequence diagrams
 - Class design – UML class diagrams
 - Modeling activities and interactions – UML activity and state diagrams
-

Module Code:
MSTIS20
Duration: 20h

Module

Advanced JAVA Programming

Objectives

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

- Develop complex applications using Java programming

List of topics

- Graphical user interfaces (AWT, swing, layout manager)
 - Listeners
 - Managing data flows
 - Java processes
 - Database connexion with JDBC
 - Sockets
-

Module Code:
MSTIS21
Duration: 20h

Module

Cloud Computing

Objectives

At the end of this module students will :

- Be familiar with fundamental cloud computing topics, in relation with both technology and business considerations

Module Code:
MSTIS22
Duration: 20h

List of topics

- Fundamental cloud computing terminology and concepts
 - Basics of virtualization
 - Specific characteristics that define a cloud
 - Understanding elasticity, resiliency, on-demand and measured usage
 - Benefits, challenges and risks of contemporary cloud computing platforms and cloud services
 - Cloud resource administrator and cloud service owner roles
 - Cloud service and cloud service consumer roles
 - Software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS) cloud delivery models
 - Public cloud, private cloud, hybrid cloud and community cloud deployment models
 - Business cost metrics and formulas for comparing and calculating cloud and on-premise solution costs
 - Service level agreements (SLAs) for cloud-based IT resources
 - Formulas for calculating and rating SLA quality of service characteristics
-

Module **JSP and Servlets**

Objectives

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

- Explain the signification and the role of servlets
- Understand and put into practice the main concepts of JSP and servlets

List of topics

- Introduction to servlets
 - Session with servlets
 - JSPs main concepts
 - Servlets and JSP pages
 - Database connectivity with JDBC
-

Module Code:
MSTIS23
Duration: 32h

Module **Information Systems and Companies**

Objectives

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

- Develop an understanding of the complex relationship between technical knowledge and business practice

List of topics

- Definitions
- Examples of contexts in which information systems support organizational processes, organizational performance and behaviour at the individual, group and organizational levels.

Module Code:
MSTIS24
Duration: 32h

Module **Information System Security**

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
-

Module Code:
MSTIS25
Duration: 20h

Module **Web-centric Development and ASP.NET**

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

Module Code:
MSTIS26
Duration: 32h

Module
Management Control and Business

Objectives

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

- 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

- Decision making
 - Managerial accounting and the business organization
 - Cost behaviour / cost-volume relationship
 - Cost allocation
 - Product costing
 - Job-costing systems
 - Process-costing systems
 - Overhead application: variable and absorption costing
 - Cost allocation and activity based costing/ activity based management
 - Planning and control
 - The master budget
 - Flexible budget and variance analysis
 - Planning and control
 - Responsibility accounting
 - Balance scorecard
-

Module Code:
MSTIS27
Duration: 32h

Module
Marketing in a Technical Environment

Objective

At the end of this module students will:

- Be familiar with new product development
- Be familiar with marketing concepts
- Be familiar with marketing strategy within new product development

List of topics

- Market research methods
- Market segmentation
- Product positioning (4 Ps)
- Price elasticity

Module Code:
MSTIS28
Duration: 12h

- Cross functional integration
 - The champion role
 - Business intelligence
 - Cross-cultural issues in marketing
 - 'Start-Up!' simulation that demonstrates marketing issues an entrepreneur faces in developing a new product
-

Module
Law & Internet, Privacy Protection

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 particular the intellectual property

List of topics

- Main origins of laws
 - The law for privacy protection and the French Commission for Privacy Protection
 - Licence contracts
 - Obligations and rights of the internet user
 - Intellectual property
 - Protection of personal datas, in particularly in an organization
-

Module Code:
MSTPM
Duration: 26h

Module
Project Management

Objectives

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

- Appreciate the need for project management as a recognised discipline
- Understand the complexity of a technical project and the need for formal methods
- Appreciate the need to break up complex projects
- Appreciate the need for effective planning, monitoring and control mechanisms
- Understand the need for formal project management organisational structures
- Understand the importance and management of stakeholders in an international project
- Construct a project timeline and resource schedule using MS Project
- Use MS Project as a planning, controlling and reporting tool
- Understand the complexities and risks introduced by international and cross-organisational project teams
- Use formal leadership techniques to manage projects and project teams

Module Code:
MSTPRO
Duration: 80h

List of topics

- Design, implementation and test of an application
 - Organization and planning of team work within project management framework
 - What are the needs to clearly establish goals and objectives for projects
 - Importance of recording and reviewing progress
-

Module

Project Development

Objectives

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

- Exercise their initiative and independence
- 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

List of topics

- Constitution of the group
- Technical / feasibility studies
- Developing functional specifications and success strategies
- Development
- Test

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

INTERNSHIP / PROFESSIONAL THESIS

The internship will take place either in a company or in a research laboratory in a university. Students are encouraged to do their internship in France or in another European country, but may choose to do so elsewhere in the world too. The duration of the internship is of 4 (min.) to 6 months (max.). ESIGELEC and INSA Rouen provide assistance to students to find internships but they are expected to play an active part, as the internships are not offered automatically.

A professional thesis will have to be submitted upon completion of the internship and the students will have to make an oral presentation before a convened jury, at ESIGELEC (or remotely, upon special written request, authorised by the school).

An internship form, providing all required information must be filled and submitted to the Internship Department at ESIGELEC, as soon as the student has obtained an offer. The Head of the Internship Department and the Academic Coordinator of the Master's Programme will validate and approve the information (if relevant) by duly signing on the said form. ESIGELEC, the company / research laboratory and the student will then countersign an Internship Agreement issued at ESIGELEC. A copy of the agreement is retained by ESIGELEC, the company or research laboratory and the student.

A faculty member of ESIGELEC or INSA Rouen will be assigned the task of visiting or contacting the student at least once during the internship. In the event of questions regarding the internship, the preparation of the oral presentation and/or the professional thesis, the student may remain in contact either with the assigned faculty member or the Academic Coordinator of the Master's Programme, during the period of the internship or thereafter.

The topic of the professional thesis chosen by the student must be communicated to the Academic Coordinator of the Master's Programme for approval, within the first month of starting the internship.

The professional thesis must be submitted to ESIGELEC one month, at the latest, after completion of the internship. The oral presentation must be made before a Jury comprising of a President (from ESIGELEC or INSA Rouen), one faculty member from ESIGELEC or INSA Rouen and the industrial tutor (if possible), two months at the latest, after completion of the internship. The total duration of the oral presentation will be of 60 minutes (30 min. presentation + 15 min. Q&A + 15 min. deliberation among jury members).

A student has a maximum period of 2 years after the final academic semester, to find the internship, complete it, submit the professional thesis and conduct the oral presentation before a convened jury at ESIGELEC.

THE STUDY BOARD

The Board of Studies, whose members are representatives from industry, universities, INSA Rouen & ESIGELEC, oversees the course content and recommends changes when necessary.

The Board of Studies, which meets at least once a year, also ensures that the course content and laboratories are streamlined in keeping with the changing industry requirements. A meeting between the Academic Coordinator of the Master's Programme and all faculty members is convened at the end of each module, to assess the relevance of the content, equipment and issues which may have occurred while delivering the module.

A meeting is also convened every two months between the Academic Coordinator of the Master's Programme and the students to discuss academic and non-academic issues.

