

# Master Degree in Computer Science and Computer Engineering

## *Characterization of the course*

The Master Degree in Computer Science and Computer Engineering emerges from the adoption of a new model of formation and the enrichment of a recognized professional profile acknowledged by the market employer. It translates the innovation and a new pedagogical strategy obtained either by the involvement of the professors in activities of post-graduation research, or through their participation in industrial projects carried through direct cooperation with public and private companies. The master incorporates the resulting influences from the industry links and the interactions with the local community. It embodies a continued experience of productive relationship, followed for the formation, technology transfer and consultancy, pointedly in the areas of real time operating systems kernels, security of information, data codification, communications and embedded systems, in domains of application such as the electronic funds' transaction, distributed systems, military communications and web services.

The normal duration of the cycle of studies is of four curricular semesters. The cycle of studies is integrated by an organized set of semester curricular units and by the dissertation or work of project, being offered in diurnal and after-labour regimens. The course includes curricular mandatory units that correspond to 24 credits ECTS and optional curricular units that correspond to 54 credits ECTS. The dissertation or work of project corresponds to 42 credits ECTS. The optional curricular units are organized in casts. The cast of main specialization also defines the area where the dissertation or work of project will be developed. The curricular units of free choice could be organized in order to constitute complementary specialization. There are specializations in information systems and communication data networks (information technology) supported by a common formation in software engineering. Among others, there are complementary specializations in embedded systems, multimedia and telecommunications, providing profiles of formation in engineering computer science and computers combining diverse domains of application.

## *Professional outcomes*

The conferred formation aims at the exercise of the professional activity of informatics and computer engineering, in accordance with the criteria established by the professional associations, assuring to the students the acquisition of a specialization. Based on a common formation in software engineering there are areas of specialization in information systems, communication data networks, systems, multimedia and telecommunications. The acquired abilities allow to the accomplishment of diverse acts of informatics and computer engineering computer where the main are outlined:

- Project specification and sizing of infrastructures of computer systems.
- Data modelling, conception and development of software. Security of computer systems and computer data networks. Security of information in that it concerns to the four basic pillars: authentication, authorization, privacy and integrity.
- Project management and supervision, maintenance and administration of

informatics systems. Management of the risks related to the development of projects.

- Consultancy and accompaniment of customers for the conception or definition of requirements of informatics solutions.
- To audit: the performance of information, the security of the information systems, the security of the systems and the communications.
- Technique direction of: informatics systems, of companies, projects and licenses of computer and informatics companies.
- Maintenance and administration of informatics systems, design and implementation of new functionalities and systems' integration.

### ***Employing Entities***

- Industry of software (informatics applications, integration systems, technological platforms).
- Rendering companies of services (banks, insurances, public administration, transports, communications and telecommunications).
- Industry of systems development and production (ATM, electronic appliances, industrial control and automation).
- Logistic operators (transports, commerce).
- Companies of services and consultancy.
- Institutions or companies who involved in Research and Development.

### ***Curricular organization***

Distribution of credits ECTS by scientific area in the Master Degree in Computer Science and Computers Engineering:

SCIENTIFIC AREA	ACRONYM	CREDITS	
		MANDATORY	OPTIONAL
Computer Science and Computers Engineering <i>Including the dissertation or work of project the one that corresponds to 42 credits ECTS</i>	IC	66	24 a 54
Electronics and Telecommunications Engineering	ET	0	0 a 24
Social and legal sciences, arts and humanities or others	CSO	0	0 a 18
<b>TOTAL</b>		<b>66</b>	<b>54</b>

Plan of studies to the degree in Computer Science and Computers Engineering:

**1<sup>st</sup> year, 1<sup>st</sup> semester**

Curricular units	Scientific area	Type	Credits	Comments
Advanced Operating Systems	IC	Semester	6,0	Compulsory
Complementary Topics on Information Systems	IC	Semester	6,0	Optional
Multimedia Networks and Services	IC	Semester	6,0	Optional
Advanced Computer Architecture	IC	Semester	6,0	Optional
Machine Learning	IC	Semester	6,0	Optional
Real Time Signal Processing	IC	Semester	6,0	Optional
Data Coding and Compression	IC	Semester	6,0	Optional
Computer Security	IC	Semester	6,0	Optional
Internet Networks	IC	Semester	6,0	Optional
Embedded Systems I	IC	Semester	6,0	Optional
Compilers	IC	Semester	6,0	Optional
Complementary *	ET/CSO/IC	Semester	6,0	Optional
Complementary *	ET/CSO/IC	Semester	6,0	Optional

**1<sup>st</sup> year, 2<sup>nd</sup> semester**

Curricular units	Scientific area	Type	Credits	Comments
Software Engineering	IC	Semester	6,0	Compulsory
Distributed Systems Infra-structures	IC	Semester	6,0	Compulsory
Decision Support Information Systems	IC	Semester	6,0	Optional
Computer Network Security	IC	Semester	6,0	Optional
Kernel mode Programming	IC	Semester	6,0	Optional
Complementary Topics on Artificial Intelligence	IC	Semester	6,0	Optional
Knowledge Representation and Processing	IC	Semester	6,0	Optional
Distributed Systems	IC	Semester	6,0	Optional
Advanced Networks	IC	Semester	6,0	Optional
Embedded Systems II	IC	Semester	6,0	Optional
Programming for Mobile Devices	IC	Semester	6,0	Optional
Digital Signal and Image Processing	IC	Semester	6,0	Optional
Artificial Intelligence	IC	Semester	6,0	Optional
Complementary *	ET/CSO/IC	Semester	6,0	Optional
Complementary *	ET/CSO/IC	Semester	6,0	Optional

**2<sup>nd</sup> year**

Curricular units	Scientific area	Type	Credits	Comments
Information System Architectures	IC	Semester	6,0	Compulsory
Information Systems Management	IC	Semester	6,0	Optional
Networks Design	IC	Semester	6,0	Optional
Embedded Systems Project	IC	Semester	6,0	Optional
Systems Integration	IC	Semester	6,0	Optional
Dissertation or Project	IC	Annual	42,0	Compulsory

Notes:

Complementary \* - chosen curricular unit of cast settled by the Scientific Council.