DEGREE IN COMPUTER ENGINEERING

The syllabus of the Degree in Computer Engineering is set up in the Resolution of June 8th, 2009 of the General Secretary of Universities that establishes the recommendations for the official degrees in the field of the Technical Engineering

Competences	1st course									databases	2nd course								3rd course								4th course	
	Introduction to Programming 1	Computer Organization 1	Computational Logic	Algebra	Physics	Introduction to Programming 2	Computer Organization 2	Statistics and Optimisation	Business management	databases	Data Structures	Operating systems	Discrete mathematics	Computer Architecture	Algorithms and Complexity	Languages, automata and grammars	Communication Networks	Human-Computer Interaction	Systems and Application Administration and Management	Legal, Social and Professional Aspects	Software Engineering	Artificial intelligence	Concurrent and Parallel systems	Databases and Software Engineering	Web Systems and Technologies	Cross-curricular Subject	Internship	Bachelor thesis
CT1																											■	■
CT2																											■	■
CT3									■																		■	
CT4									■											■						■	
CT5				■	■			■					■															
EPS1	■	■	■	■	■	■	■	■			■	■	■		■				■								■	■
EPS2																											■	■
EPS3																											■	■
EPS4																											■	■
EPS5	■	■	■	■	■	■	■	■			■		■	■	■	■											■	■
EPS6												■							■			■					■	■
EPS7																								■		■	■	■
EPS8																											■	■
EPS9	■	■				■	■					■							■								■	■
EPS10																											■	■
EPS11										■							■							■		■	■	
EPS12																		■					■	■				
EPS13									■												■						■	■
GII-FB1				■			■						■														■	■
GII-FB2					■																						■	■
GII-FB3	■	■				■					■		■														■	■
GII-FB4	■	■																									■	■

GII-FB5
GII-FB6
GII-CRI1
GII-CRI2
GII-CRI3
GII-CRI4
GII-CRI5
GII-CRI6
GII-CRI7
GII-CRI8
GII-CRI9
GII-CRI10
GII-CRI11
GII-CRI12
GII-CRI13
GII-CRI14
GII-CRI15
GII-CRI16
GII-CTI17
GII-CRI18

DEGREE IN COMPUTER ENGINEERING
Subjects Major in Computing, Software Engineering, Information Technologies, Computers Engineering and Information System

Competences	Computing							Software Engineering							Information Technologies							Computers Engineering							Information System						
	Advanced Programming in Artificial Intelligence	Computational Models and Complexity	Automatic Learning and Reasoning	Distributed Computing	Computational tools for problem solving	Language Processing Algorithms	Hardware and Software Verification Systems	Requirements Engineering	Quality Management and Improving	Process Models	Software Architectures	Free Software Engineering	Systems Integration	Project Management	Computer Networks and Communications	Applications for Mobile Devices	User-Centered Design	Distributed Computing and Applications	Applications and Communications Security	Enterprise Software Architecture	Networked Computing Platforms	Digital systems	Distributed Operating Systems	Computer Networks	Advanced Computers Architecture	Real Time Systems	Administration and Security of Computer Systems	Embedded Systems	Information Systems Networks	Analysis, modelling and design Of IF	Management, Organisation and Leadership of Technological Projects	Information Systems Architecture	New economy and e-business	Strategic aspect of information systems	Business Models Systems
CT1																																			
CT2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CT3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CT4																																			
CT5																																			
EPS1																																			
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EPS3																																			
EPS4																																			
EPS5																																			
EPS6	X	X	X	X	X	X	X																												
EPS7																																			
EPS8																																			
EPS9																						X	X	X	X	X	X	X							
EPS10																													X	X	X	X	X	X	X
EPS11								X	X	X	X	X	X	X	X	X	X	X	X	X	X														
EPS12																																			
EPS13																																			
GII-C1		X			X	X																													
GII-C2						X																													
GII-C3	X	X		X	X																														

GII-C4																																													
GIIC5																																													
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Strategic Competences of the UdL according to the "Plan Director de la Docència" approved by the Government Council of UdL on July 10th, 2007.

CT1. Acquire a suitable understanding of written, oral Catalan and Spanish.

CT2. Mastering a foreign language, especially English.

CT3. Training Experience in the use of the new technologies and the information and communication technologies.

CT4. Acquire basic knowledge of entrepreneurship and professional environments.

CT5. Acquire knowledge in scientific thinking.

Cross-disciplinary competences approved by the Plenary Commission of the Degrees of Industrial Engineering, Computer Engineering and Building Engineering, gathered on June 16th, 2008.

EPS1. Capacity to solve problems and prepare and defence arguments inside the area of studies.

EPS2. Capacity to gather and interpret relevant data, within the area of study, to judge and think about relevant subjects of social, scientific and ethical nature.

EPS3. Capacity to convey information, ideas, problems and solutions to both a specialized and no specialized public.

EPS4. To have the skills required to undertake new studies or improve the training with self-direction.

EPS5. Capacity of abstraction and of critical, logical and mathematical thinking.

EPS6. Capacity of analysis and synthesis.

EPS7. Capacity to work in situations with a lack of information and/or under pressure.

EPS8. Capacity of planning and organizing the personal work.

EPS9. Capacity for unidisciplinary and multidisciplinary teamwork.

EPS10. Capacity to take part in the structure of a company.

EPS11. Capacity to understand the needs of the user expressed in a no technical language.

EPS12. To be motivated for the quality and steady improvement.

EPS13. Capacity to consider the socioeconomic context as well as the sustainability criteria in engineering solutions.

Specific competences that the students have to acquire in the degree in Computer Engineering set in the Royal decree 1393/2007, of October 29th

Module of basic training

GII-FB1. Capacity to solve mathematical problems arisen in the engineering field. Aptitude to apply knowledge on: linear algebra; differential and integral calculus; numerical methods; algorithmic, numerical; statistics and optimisation.

GII-FB2. Understanding and commanding basic concepts of fields and waves and electromagnetism, theory of electrical circuits, electronic circuits, physical principle of the semiconductors and logical families, electronic and photonic devices, and his application for the resolution of problems in the engineering.

GII-FB3. Capacity to understand and master the basic concepts of discreet mathematics, logical, algorithmic and computational complexity, and its application to solve engineering problems.

GII-FB4. Basic knowledge of the use and programming of computers, operating systems, databases and computer programs with applications in engineering.

GII-FB5. Knowledge of the structure, organisation, operation and interconnection of the computer systems, the basics of programming, and its application to solve engineering problems.

GII-FB6. Suitable knowledge of the concept of company, institutional and legal framework of the company. Business organisation and management.

Module of common training in the computer branch

GII-CRI1. Capacity to design, develop, select and evaluate applications and computer systems, ensuring its reliability, security and quality, according to ethical principles and to the legislation.

GII-CRI2. Capacity to plan, conceive, deploy and direct projects, services and computer systems in all the fields, leading his set up and his continuous improvement and evaluation his economic and social impact.

GII-CRI3. Capacity to understand the importance of negotiations, the efficient work, the leadership and the skills of communication in all the software development environments.

GII-CRI4. Capacity to write the technical conditions of a computer installation that fulfil the legal standards.

GII-CRI5. Knowledge, manage and maintain systems, services and computer applications.

GII-CRI6. Knowledge and application of the basic algorithmic procedures of the computer technologies to design problem solving, analysing the suitability and complexity of the algorithms proposed.

GII-CRI7. Knowledge, design and efficient use of the types and data structure more suitable for solving a problem.

GII-CRI8. Capacity to analyse, design, build and keep safety and efficiency in applications, choosing the paradigm and the most suitable programming languages.

GII-CRI9. Capacity to know, comprise and evaluate the structure and architecture of computers, as well as the basic components that conform them.

GII-CRI10. Knowledge of the characteristics, functionalities and structures of the operating systems and design and implement applications based in their services.

GII-CRI11. Knowledge and application of the characteristics, functionalities and structure of the Distributed Systems, the Networks of Computers and Internet and design and implement applications based in them.

GII-CRI12. Knowledge and application of the characteristics, functionalities and structure of the databases, that allow their suitable use, and the design and the analysis and implementation of applications based in them.

GII-CRI13.Knowledge and application of the necessary tools for the storage, processing and access to the Systems of information, including those based in web.

GII-CRI14. Knowledge and application of the basic principles and basic techniques of the parallel, concurrent, distributed and of real time programming, .

GII-CRI15. Knowledge and application of the basic principles and basic techniques of the intelligent systems and his practical application.

GII-CRI16. Knowledge and application of the principles, methodologies and life cycle of the software engineering.

GII-CRI17. Capacity to design and evaluate person-computer interfaces that guarantee the accessibility and usability of systems, services and computer applications.

GII-CRI18. Knowledge of the rules and the regulations of computing in national, European and international level.

Module of training of specific technology. Computing

GII-C1. Capacity to have a deep knowledge of the basic principles and models for computation and to know how to apply them in order to interpret, select, value, model, and create new concepts, theories, uses and technological developments related with the informatics.

GII-C2. Capacity to know the theoretical basics of the programming languages and the techniques of lexical, syntactic and associated semantic processing, and know how to apply them for the creation, design and processing of languages.

GII-C3. Capacity to evaluate the computational complexity of a problem, to know the algorithmic strategies that can drive to its solving and recommend, develop and implement the one which guarantee the best performance in accordance with the requirements.

GII-C4. Capacity to understand the basics, paradigms and techniques of the intelligent systems and analyse, design and build systems, services and computer applications that use these techniques in any field of application.

GII-C5. Capacity to acquire, obtain, formalise and represent the human knowledge in a computable form to solve problems by means of a computer system in any field of application, particularly in the ones related with computation, perception and performance in environments or intelligent surroundings.

GII-C6. Capacity to develop and evaluate interactive systems and of presentation of complex information and its application to solve problems of design of computer-person interaction.

GII-C7. Capacity to know and develop techniques of computational learning and design and implement applications and systems that use them, including the ones devoted to automatic extraction of information and knowledge from big volumes of data.

Module of training of specific technology. Software Engineering

GII-IS1. Capacity to develop, maintain and evaluate services and software systems that satisfy all the requirements of the user and behave in a reliable and efficient way, they can develop, keep and fulfil quality requirements, applying the theories, principles, methods and uses of the software engineering.

GII-IS2. Capacity to value the customer needs and specify the software requirements to satisfy these needs, solving conflicts by means of acceptable commitments taking into account the limitations of cost, time, existence of systems already developed and of the own organisations.

GII-IS3. Capacity to give solution to problems of integration taking into account the strategies, standards and available technologies.

GII-IS4. Capacity to identify and analyse problems and design, develop, implement, verify and find software solutions on the base of a suitable knowledge of the theories, models and current techniques.

GII-IS5. Capacity to identify, evaluate and manage the potential risks that can arise.

GII-IS6. Capacity to design suitable solutions in one or more fields of application using methods of software engineering that integrate ethical, social, legal and economic issues.

Module of training of specific technology. Information Technologies

GII-TI1. Capacity to understand the environment and needs of an organisation in the field of the information and communication technologies.

GII-TI2. Capacity to choose, design, deploy, integrate, evaluate, build, manage, explode and keep the hardware, software and network technologies inside the cost and quality requirements.

GII-TI3. Capacity to use methodologies based in the user and the organisation in order to develop, evaluate and manage applications and systems based in the information technologies that ensure the accessibility, ergonomics and usability of the systems.

GII-TI4. Capacity to choose, design, deploy, integrate and manage networks and infrastructures of communications in an organisation.

GII-TI5. Capacity to select, deploy, integrate and manage systems of information that satisfy the needs of the organisation, within the cost and quality requirements.

GII-TI6. Capacity to conceive systems, applications and services based in network technologies, including Internet, web, e-commerce, multimedia, interactive services and mobile computation.

GII-TI7. Capacity to comprise, apply and manage the computer systems guarantee and security.

Module of training of specific technology. Computer Engineering

GII-IC1. Capacity to design and build digital systems, including computers, microprocessors and communication systems.

GII-IC2. Capacity to develop specific processors and systems embedded, as well as develop and optimise the software of these systems.

GII-IC3. Capacity to analyse and evaluate architectures of computers, including parallel and distributed platforms, as well as develop and optimise software for them.

GII-IC4. Capacity to design and implement system and communications software.

GII-IC5. Capacity to analyse, evaluate and choose hardware and software platforms more adapted for the embedded and real time applications.

GII-IC6. Capacity to understand, apply and manage the guarantee and security of the computer systems.

GII-IC7. Capacity to analyse, evaluate, select and configure hardware platforms for the development and execution of applications and computer services

GII-IC8. Capacity to design, deploy, administer and manage computer networks.

Module of training of specific technology. Information System

GII-SI1. Capacity to integrate information and communication technology solutions and business to satisfy the needs of information of the organisations, allowing them to reach their aims effectively and efficiently, giving them a competitive advantage.

GII-SI2. Capacity to determine the requirements of the information and communication systems of an organisation taking into account security issues and fulfilment of the rules and regulations.

GII-SI3. Capacity to actively participate in the specification, design, implementation and maintenance of information and communication systems.

GII-SI4. Capacity to comprise and apply the principles and practices of the organisations, so that they can exert like a link between the technique and management communities of an organisation and participate actively in the users training.

GII-SI5. Capacity to understand and apply the principles of risks evaluation and apply them properly in the preparation and execution of plans of performance.

GII-SI6. Capacity to understand and apply the principles and the techniques of quality management and of technological innovation in organisations.