

1. Key Information		
Module Code: 13609	Module Title: Computer Science	
Credit Points: 6	Module Status: Compulsory	Module Block: Basic education
Course Title: BSc in Engineering and Management		Module Theme: Computer Science

2. Lecturer: Pau Arce	Tutorial Hours: By appointment – Monday 16:00 – 18:00
------------------------------	--

3. Required Reading:	
Structured Computer Organization	A.S. Tanenbaum, T.Austin. 6 th ed. Pearson 2013.
Simple Program Design. A step-by-step approach	L.A. Robertson. 5 th ed. Thomson 2006.
A Byte of Python	Swaroop C H, https://python.swaroopch.com/
Python basics	Learn Python. https://www.learnpython.org/
Computer Networks	A.S. Tanebaum, D.J. Wetherall. 5 th ed. Pearson 2011.
Fundamentals of Database Systems	R. Elmasri, S. Navathe. 7 th ed. Pearson 2016.

4. General overview of the module
<p>The subject Computer Science is a basic subject that collects and describes the fundamentals of computer systems, both hardware and software. The fundamental part of the subject is the introduction to the development of algorithms and structured programming, as well as knowledge, management and Database design.</p> <p>The subject also deals with basic aspects about hardware and software and the possibilities they offer in the business and engineering context.</p> <p>With this subject, the student will be able to understand the structure of a program. The student is also provided with basic knowledge of the parts that constitute a computer system and the operation of operating systems, and software used in engineering and business environment. The training provided to the student enables them to be able to extrapolate the knowledge acquired to other infrastructures, so that the skills acquired are useful in their professional development in the medium and long term.</p>

5. Recommended prior knowledge
None

6. Module objectives – Learning outcomes
Key Competences
01 - Ability to work in teams in multilingual, multidisciplinary and multicultural environments.
02 - Use the techniques, skills and technological and economic tools necessary for the professional practice of engineering and business management.
03 - Define, solve and expose systemically complex technical problems.
04 - Learn to analyze the different elements that interact in business decisions.
05 - Be able to express in formal, graphic and symbolic languages necessary to understand each other in engineering and business environments.
CB1 - The students have demonstrated to possess and to understand knowledge in an area of study that starts from the base of the general secondary education, and is usually found to a level that, although it relies on advanced textbooks, also includes some aspects Which involve knowledge from the vanguard of their field of study.
CB5 – The students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.
Specific Competences
12 - Manage the information of a company using the appropriate technology and systems.
15 - Apply the basic knowledge on programming of computers, operating systems, databases and information systems in the company.

7. Teaching and learning units	
Unit	Schedule
1.- Computer systems and computer architectures <ul style="list-style-type: none"> Introduction to computer systems. Architecture of computers and internal elements. Information and data in computers. 	Weeks 1-2
2.- Fundamentals of programming. Algorithms and structured programming <ul style="list-style-type: none"> Structured programming: I/O, loops, operations. 	Weeks 3-7

<ul style="list-style-type: none"> ▪ Data management: variables, arrays and matrices. ▪ Design of algorithms. ▪ Introduction to programming languages (Python, Object Oriented Programming). 	
<p>3.- Operating systems and software for engineering.</p> <ul style="list-style-type: none"> ▪ Introduction to operating systems. ▪ Networks, Internet and Cloud. ▪ Communications. ▪ Software. ▪ Other applications of specific use in engineering. 	Weeks 8-11
<p>4.- Databases</p> <ul style="list-style-type: none"> ▪ Introduction: Information Systems, Databases and DBMS. ▪ Structure of databases. Relational Databases. ▪ Design of databases. Relation model and E-R model. ▪ Management of databases and advanced topics. 	Weeks 12-15

8. Teaching and learning methods

Unit	Theory (Classroom)	Practical (Classroom)	Practical (Laboratory)	Practical (Classroom)	Practical (ICT)	Self-guided study	TOTAL HOURS
1	8					30	38
2	12				8	25	45
3	6				8	25	39
4	10				8	25	43
TOTAL HOURS	36				24	105	165

9. Assessment

Overview	Nº of activities	Weighting (%)
<p>Continuous assessment:</p> <ul style="list-style-type: none"> • Questions of the unit (multiple choice, short answers, true/false, etc.) • Academic assignments <ul style="list-style-type: none"> ○ Projects and/or works related with algorithms, programming and databases. ○ Oral presentation and/or delivery of a task that demonstrate effort and quality in the work of the student. 	4	20
<p>Synthesis test (exam):</p> <ul style="list-style-type: none"> ○ Open answer ○ Multiple choice ○ A 1st general call with partial content (in November). ○ A 2nd general call (in January). ○ A 3rd general call for recovery (in April). <p>The 1st general call includes only content from Unit 1 and Unit 2. The 2nd general call may include all didactic units. The 3rd general call (recovery) may include all didactic units.</p> <p>The synthesis test combines both theoretical and practical contents.</p>	1	20
	1	40
<p><i>Student evaluation will consist of both continuous and summative assessments:</i></p> <ol style="list-style-type: none"> 1. <i><u>Continuous assessment:</u> The submission of practical work either carried out individually or in groups and participation in the different activities both inside the classroom, such as the analysis, summation and discussion of required readings, and outside including company visits, will account for this mark. This part of the assessment carries a weighting of 40% towards the final mark.</i> 2. <i><u>Summative assessment:</u> These tests can combine both theoretical and practical content. This part of the assessment carries a weighting of 60% towards the final mark.</i> 		

Continuous assessment is attendance based and non-recoverable. Therefore, the mark obtained for this part of the assessment will serve for both the first summative assessment and any subsequent repeat if required. The repeat will only be available at the end of the semester.

In order to pass the module an average of 5 or more in summative tests must be obtained. The final mark will be calculated by the average weightings of the summative assessment in combination with the continuous assessment. The final mark achieved must be 5 or above to pass the module.

Attendance is compulsory to ensure that you extract the most value from the module and meet the learning requirements. Therefore, session absence accounting for more than 15% of the prescribed hours will result in the inability to be awarded a mark for continuous assessment. Consequently, the maximum mark that can be achieved will be that obtained solely from the summative assessments.

Students enrolling in the module for the second time will receive specific instructions from their lecturer on what is required for them to pass the continuous assessment element. The final mark will be obtained by combining the summative assessment (80%) and the continuous assessment (20%), having to gain a final mark equal to or greater than 5 to pass the module.

All students must comply with the rules of writing, spelling and grammar in the development of their work and their assessment tests.