

## 820090 - PRE - Programming for Engineers

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering

Teaching unit: 723 - CS - Department of Computer Science

Academic year: 2019

Degree: BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 6 Teaching languages: Catalan, Spanish

### Teaching staff

Coordinator: JAVIER FARRERES DE LA MORENA - FERRAN JUAN BARUEL

Others: Primer quadrimestre:  
JAVIER FARRERES DE LA MORENA - T11, T12  
FERRAN JUAN BARUEL - T11, T12

### Prior skills

This is a second programming course. Preferably it is desirable that the students have acquired already the basic programming abilities (done in Informàtica Q1).

### Degree competences to which the subject contributes

Specific:

1. Understand the basics behind the use and programming of PCs, operating systems, databases and software with applications in engineering.

Transversal:

2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

### Teaching methodology

There are weekly one theory session and one practice session in computer laboratory. In parallel the students will propose and develop a project. Some practice sessions along the course will be devoted to the proposal. Collaborative learning. Project based learning (PBL).

### Learning objectives of the subject

## 820090 - PRE - Programming for Engineers

### Learning objectives:

1. Analyzing complex problems by means of mechanisms or reduction to smaller problems.
2. Introducing the student to the use of abstract data types.
3. Introducing the student to Object Oriented Programming.
4. Introducing the student to Event Oriented Programming and development of applications with graphical interface (GUI)

### Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Self study:	90h	60.00%

## 820090 - PRE - Programming for Engineers

### Content

Introduction	Learning time: 10h Theory classes: 2h Laboratory classes: 4h Self study : 4h
Description: Tasks and evaluation method is explained.	
Analysis and life cycle	Learning time: 6h Theory classes: 2h Self study : 4h
Description: -	
Application design	Learning time: 36h Theory classes: 14h Laboratory classes: 2h Self study : 20h
Description: Diverse methodologies of application design are explained and practiced. Specific objectives: Diseño descendente Diseño modular Diseño orientado a objetos Diseño modular	
Abstract data types	Learning time: 6h Theory classes: 2h Self study : 4h
Description: -	

## 820090 - PRE - Programming for Engineers

Programming in graphic environment	Learning time: 20h Laboratory classes: 10h Self study : 10h
Description: Basic notions are explained need to program visual elements, and a project is developed.	
-	Learning time: 8h Theory classes: 4h Laboratory classes: 4h
Description: -	
(ENG) Desarrollo	Learning time: 64h Theory classes: 10h Laboratory classes: 10h Self study : 44h
Description: -	

### Qualification system

The subject is valued in successive deliverables of a project the student develops along the course. The various deliverables and their weights are the following:

Descendent Design(I) 5%  
 Descendent Design(II) 15%  
 Object Oriented Design 20%  
 Portfolio Practice 20%  
 Final Project 40%

### Regulations for carrying out activities

There is no final exam.

## 820090 - PRE - Programming for Engineers

### Bibliography

#### Basic:

Yourdon, Edward. Techniques of program structure and design. Englewood Cliffs, NJ: Prentice-Hall, 1975. ISBN 013901702X.

Parnas, D. L. "On the criteria to be used in decomposing systems in modules". Communicatios of the ACM [on line]. [Consultation: 31/08/2017]. Available on: <<https://www.cs.umd.edu/class/spring2003/cmsc838p/Design/criteria.pdf>>.

Summerfield, Mark. Rapid GUI programming with Python and Qt : the definitive guide to PyQt programming. Upper Saddle River, NJ: Prentice Hall, 2007. ISBN 9780132354189.

Matthes, Eric. Python Crash Course : a hands-on, project-based introduction to programming [on line]. San Francisco: No Starch Press, 2016 [Consultation: 14/09/2017]. Available on: <<http://site.ebrary.com.recursos.biblioteca.upc.edu/lib/upcatalunya/detail.action?docID=11250493>>. ISBN 9781593277390.