

## Course guide

### 820090 - PRE - Programming for Engineers

Last modified: 27/05/2024

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 723 - CS - Department of Computer Science.

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

**Academic year:** 2024    **ECTS Credits:** 6.0    **Languages:** Catalan, Spanish

#### LECTURER

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**Coordinating lecturer:** 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

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

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**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

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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

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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

Type	Hours	Percentage
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	90,0	60.00

Total learning time: 150 h

## CONTENTS

### Introduction

**Description:**

Tasks and evaluation method is explained.

**Full-or-part-time:** 10h

Theory classes: 2h

Laboratory classes: 4h

Self study : 4h

### Analysis and life cycle

**Description:**

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**Full-or-part-time:** 6h

Theory classes: 2h

Self study : 4h

### Application design

**Description:**

Diverse methodologies of application design are explained and practiced.

**Specific objectives:**

Diseño descendente

Diseño modular

Diseño orientado a objetos

Diseño modular

**Full-or-part-time:** 36h

Theory classes: 14h

Laboratory classes: 2h

Self study : 20h



### Abstract data types

**Description:**

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**Full-or-part-time:** 6h

Theory classes: 2h

Self study : 4h

### Programming in graphic environment

**Description:**

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**Full-or-part-time:** 20h

Laboratory classes: 10h

Self study : 10h

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**Description:**

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**Full-or-part-time:** 8h

Theory classes: 4h

Laboratory classes: 4h

### (ENG) Desarrollo

**Description:**

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**Full-or-part-time:** 64h

Theory classes: 10h

Laboratory classes: 10h

Self study : 44h

## GRADING 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:

Visual Design 15%

Competency Work 15%

Object Oriented Design 20%

Portfolio 20%

Final Project 40%

## EXAMINATION RULES.

There is no final exam.



## BIBLIOGRAPHY

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### 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: 22/04/2020]. Available on: <https://doi-org.recurso.s.biblioteca.upc.edu/10.1145/361598.361623>.
- 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: 09/06/2020 ]. Available on : <https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=4503145>. ISBN 9781593277390.