Course guide
240018 - 240018 - Computer Science

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 723 - CS - Department of Computer Science.
Degree: Academic year: 2023  ECTS Credits: 6.0
Languages: Catalan

LECTURER
Coordinating lecturer: ANTONI SOTO RIERA

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE3. Basic knowledge on the use and programming of computers, operative systems, data bases and computer software with an engineering application.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

1. Apply fundamental computer programming concepts.
2. Show skill in using the basic programming techniques and tools.
3. Be able to solve problems by developing small and medium-sized programs.
4. Be able to use abstract models for solving real problems.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Practical classes</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## Programming environment

**Description:**
- Basic laboratory work tools.
- ETSEIB's computer system. Available Resources
- Using the operating system shell. Basic commands.
- Using the Python interpreter.

**Full-or-part-time:** 10h
Practical classes: 4h
Self study : 6h

## Programming fundamentals

**Description:**
- Fundamental programming concepts.
- Algorithm, program, programming language (Python).
- Type, variable, expression, assignment.
- File, input/output.

**Full-or-part-time:** 50h
Theory classes: 10h
Practical classes: 10h
Self study : 30h

## Data structures

**Description:**
- Python built-in types:
  - String.
  - List.
  - Tuple.
  - Dictionary.
- Representation of vectors and matrices.

**Full-or-part-time:** 50h
Theory classes: 10h
Practical classes: 10h
Self study : 30h
Program design

Description:
Introduction to structured and object-oriented programming.
- Programming schemes on sequences.
- Program documentation and testing.
- Object-oriented programming: object, class, method. Module, scope.
- Efficiency of programs.

Full-or-part-time: 40h
Theory classes: 10h
Practical classes: 6h
Self study : 24h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink:
- https://docs.python.org/3/. Python documentation
- https://inf1.etseib.upc.edu. Course material