Course guides
280603 - 280603 - Informatics

Unit in charge: Barcelona School of Nautical Studies
Teaching unit: 707 - ESAII - Department of Automatic Control.
Degree: BACHELOR'S DEGREE IN NAUTICAL SCIENCE AND MARITIME TRANSPORT (Syllabus 2010). (Compulsory subject).

Academic year: 2020  ECTS Credits: 6.0  Languages: Catalan, English

LECTURER
Coordinating lecturer: JORDI FONOLLOSA MAGRINYA
Others:
Prime quadrimester:
FRANCISCO JAVIER AYMERICH MARTINEZ - GNTM1, GNTM2
JORDI FONOLLOSA MAGRINYA - GNTM1, GNTM2

Segon quadrimester:
FRANCISCO JAVIER AYMERICH MARTINEZ - GNTM
JORDI FONOLLOSA MAGRINYA - GNTM
MISLAV JORDANIC - GNTM

REQUIREMENTS
One group (problem + laboratory) will be in English. Check the schedule for further details.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES
Specific:
2. Basic knowledge on using and programming computers, operating systems, databases and computer programs for engineering applications.

Transversal:
1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT
When the student completed the course must be able to:
Describe a computer from the point of view of its architecture and structure.
Describe the computer operational system functions.
Make programs in high-level computer languages.
Design databases and use computer applications used in marine engineering.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>4.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>15,0</td>
<td>10.00</td>
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<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>84,0</td>
<td>56.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

**(ENG) Theme 1: Introduction to computers**

**Description:**
The computers, architecture and structure of the computer systems. Introduction to the operating systems.

**Full-or-part-time:** 12h
Theory classes: 4h  
Self study : 8h

**(ENG) Theme 2.1: Introduction to digital systems**

**Description:**
Systems and signals, computer structures, numerical systems and binary arithmetic, coding information.

**Full-or-part-time:** 10h
Theory classes: 2h  
Practical classes: 2h  
Self study : 6h

**(ENG) Theme 2.2: Logic functions and combinational systems**

**Description:**
The logic and the Boole algebra, logic functions, functions simplification, implementation and synthesis of logic functions, combinational blocs.

**Full-or-part-time:** 18h
Theory classes: 4h  
Practical classes: 2h  
Laboratory classes: 2h  
Guided activities: 2h  
Self study : 8h
### (ENG) Theme 2.3: Sequential systems

**Description:**
Concepts and definitions, bistables, implementation of sequential systems, registers, counters, memories.

**Full-or-part-time:** 17h  
Theory classes: 3h  
Practical classes: 2h  
Laboratory classes: 2h  
Guided activities: 2h  
Self study : 8h

### (ENG) Theme 2.4: Basic structure of the computers

**Description:**
Basic computer design: instruction set, format of the instructions, process sub-system, control sub-system.

**Full-or-part-time:** 8h  
Theory classes: 2h  
Guided activities: 2h  
Self study : 4h

### (ENG) Theme 3.1: Introduction to algorithmic

**Description:**
Concepts and definitions, downstream analysis: program design cycle, introduction to C language, functions and procedures.

**Full-or-part-time:** 14h  
Theory classes: 4h  
Practical classes: 2h  
Guided activities: 2h  
Self study : 6h

### (ENG) Theme 3.2: Basic algorithmic structures

**Description:**
Instructions organization: Sequential structures, conditional structures, iterative structures, program execution: the program trace.

**Full-or-part-time:** 20h  
Theory classes: 2h  
Practical classes: 4h  
Laboratory classes: 2h  
Guided activities: 4h  
Self study : 8h
### (ENG) Theme 3.3: Algorithmic structures

**Description:**
The list. Creating a list, move through structures and search structures.

**Full-or-part-time:** 18h
- Theory classes: 2h
- Practical classes: 2h
- Laboratory classes: 4h
- Guided activities: 2h
- Self study: 8h

### (ENG) Theme 4.1: Introduction to local area networks

**Description:**
Local area networks types, networks components, architecture, protocols and services in a network.

**Full-or-part-time:** 16h
- Theory classes: 4h
- Practical classes: 2h
- Laboratory classes: 2h
- Self study: 8h

### (ENG) Theme 4.2: The NMEA bus

**Description:**
The NMEA bus as a network. Physical elements that can be communicated by the NMEA bus. The NMEA sentences.

**Full-or-part-time:** 7h
- Theory classes: 1h
- Laboratory classes: 2h
- Self study: 4h

### (ENG) Theme 5: Marine computer applications

**Description:**
Management of computer applications for the use in the marine environment. Design and use of databases.

**Full-or-part-time:** 10h
- Theory classes: 2h
- Guided activities: 2h
- Self study: 6h
GRADING SYSTEM

Evaluation

The final qualification is the sum of the following partial qualifications:

\[ N_{\text{final}} = 0.4N_{\text{pf}} + 0.3N_{\text{ac}} + 0.2N_{\text{eL}} + 0.1N_{\text{ad}} \]

where

- \( N_{\text{final}} \): final qualification.
- \( N_{\text{pf}} \): this is the qualification obtained in the final exam.
- \( N_{\text{ac}} \): this is the qualification obtained in the continuous evaluation.
- \( N_{\text{eL}} \): this is the qualification obtained in the laboratory (practice works in the informatics classroom).
- \( N_{\text{ad}} \): this is the qualification obtained in the guided activities.

The continuous evaluation (\( N_{\text{ac}} \)) will consist of the carrying out of partial exams throughout the course, one of digital systems (units 1 and 2), one of algorithmic (unit 3) and one of networks and applications (units 4 and 5), with the following weightings:

\[ N_{\text{ac}} = 0.4 \times T_{1-2} + 0.35 \times T_{3} + 0.25 \times T_{4-5} \]

The evaluation of the teaching in the laboratory (\( N_{\text{eL}} \)) will take into account the \( N_{\text{eLc}} \) note corresponding to the work in the computer room (activity and report) and the note of two written tests, \( PT_{2} \) (test on the practices of Unit 2) and \( PT_{3} \) (Test on the practices of the Unit 3)

\[ N_{\text{eL}} = 0.2 \times PT_{1} + 0.2 \times PT_{2} + 0.6 \times N_{\text{eLc}}. \]

where

- \( N_{\text{eLc}} \): this is the qualification obtained in the reports carried out at the classroom (laboratory, informatics classroom).
- \( N_{\text{eLcT2}} \): this is the qualification obtained in the classroom report of Unit 2.
- \( N_{\text{eLcT3}} \): this is the qualification obtained in the classroom report of Unit 3.

The evaluation of the guided activities (\( N_{\text{ad}} \)) is:

\[ N_{\text{ad}} = 0.3 \times N_{\text{adT2}} + 0.4 \times N_{\text{adT3}} + 0.3 \times N_{\text{adT4-5}}. \]

where

- \( N_{\text{adT2}} \): this is the qualification obtained in the guided activities of Unit 2.
- \( N_{\text{adT3}} \): this is the qualification obtained in the guided activities of Unit 3.
- \( N_{\text{adT4-5}} \): this is the qualification obtained in the guided activities of Unit 4-5.

The evaluation of the guided activities is to perform different activities, individual and formative nature made during the year (outside the classroom).

All of lab activities, tests or guided activities that are not carried out will be evaluated with zero, whenever that there has not been justifiable reason.

It will be considered as not presented all the students who do not present to the final exam.

Re-evaluation

All those students who obtain a grade equal to or greater than 3 and less than 5 will be entitled to a re-evaluation test.
EXAMINATION RULES.

All of lab activities, tests or guided activities that are not carried out will be evaluated with zero, whenever that there has not been justifiable reason.

It will be considered as not presented all the students who do not present to the final exam.

BIBLIOGRAPHY

Basic: