

Course guide

270160 - APC - PC Architecture

Last modified: 13/07/2023

Unit in charge: Barcelona School of Informatics
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: FERMIN SÁNCHEZ CARRACEDO

Others: Primer quadrimestre:
JOSEP-LLORENÇ CRUZ DIAZ - 10
AGUSTÍN FERNÁNDEZ JIMÉNEZ - 10
DAVID LÓPEZ ÁLVAREZ - 10
FERMIN SÁNCHEZ CARRACEDO - 10

PRIOR SKILLS

Basic knowledge of computer architecture

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CT3.6. To demonstrate knowledge about the ethical dimension of the company: in general, the social and corporate responsibility and, concretely, the civil and professional responsibilities of the informatics engineer.

CT6.2. To demonstrate knowledge, comprehension and capacity to evaluate the structure and architecture of computers, and the basic components that compound them.

CT8.1. To identify current and emerging technologies and evaluate if they are applicable, to satisfy the users needs.

Generical:

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

TEACHING METHODOLOGY

The student attends class and study the material presented.

During the course does a report about the subject and makes a public presentation.

By the end of the course makes a practice of assembling and repairing computers in Reutilitza workshop.

LEARNING OBJECTIVES OF THE SUBJECT

1. Be able to describe the architecture of a current personal computer
2. Having a historical overview of the evolution of processors, semiconductor memories, storage devices, motherboards and BIOS
3. Be able to describe the characteristics of the memory types that can be found on a PC
4. Being able to explain how the motherboards, chipsets and buses work, and how they affect computer performance
5. Being able to explain the basic principles of the BIOS and know how adjust the BIOS of the computer
6. Be able to describe the components that allow to add new features to a computer
7. Being able to explain the operation and the reason for the existence of graphics cards
8. Being able to describe the transfer system with input/output and storage systems, the basic operating principles and the parameters to consider when incorporating them into a computer
9. Be able to describe some current tools to evaluate the elements in a computer
10. Having a vision of the possible evolution in the short/medium term of all the elements studied
11. Increasing the ability of oral and written communication
12. Acquire a commitment to values ☐☐ such as solidarity, justice and progress
13. Increasing sensitivity to the environment

STUDY LOAD

Type	Hours	Percentage
Guided activities	6,0	4.00
Hours small group	30,0	20.00
Self study	84,0	56.00
Hours large group	30,0	20.00

Total learning time: 150 h

CONTENTS

Brief history of microprocessors

Microprocessors for PCs

Memories for PCs

Motherboards, BIOS, chipsets and buses

Graphic cards

Storage Devices: Hard Drives, CD, DVD, other

Input/output/devices

Performance Evaluation Software

ACTIVITIES

course work

Description:

Preparation of course work

Specific objectives:

11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 42h 24m

Self study: 42h 24m

Public presentation of the course work

Description:

Public presentation of the course work

Specific objectives:

11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 8h

Self study: 8h

Subject presentation

Description:

Attendance and class participation

Specific objectives:

12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Microprocessors

Description:

Attendance and class participation

Specific objectives:

1, 2, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 11h

Theory classes: 8h

Self study: 3h

Memory

Description:

Attendance and class participation

Specific objectives:

2, 3, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 5h 30m

Theory classes: 4h

Self study: 1h 30m

Talks presentations and reports

Description:

Attendance and class participation

Specific objectives:

11

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Sustainability and social commitment talk

Description:

Attendance and class participation

Specific objectives:

12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Motherboards and expansion buses

Description:

Attendance and class participation

Specific objectives:

2, 4, 6, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 5h 30m

Theory classes: 4h

Self study: 1h 30m

First session of public presentations

Description:

The student makes a public presentation about the technical report developed

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

input/output and storage

Description:

Attendance and class participation

Specific objectives:

2, 6, 8, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 11h

Theory classes: 8h

Self study: 3h

second session of public presentations

Description:

The student makes a public presentation about the technical report developed

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Graphic cards

Description:

Attendance and class participation

Specific objectives:

2, 6, 7, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 7h

Theory classes: 4h

Self study: 3h

Media buses

Description:

Attendance and class participation

Specific objectives:

2, 6, 8, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Third session of public presentations

Description:

The student makes a public presentation about the technical report developed

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Bios, chipsets and formfactors

Description:

Attendance and class participation

Specific objectives:

2, 4, 5, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Fourth session of public presentations

Description:

The student makes a public presentation about the technical report developed

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Overclocking, thermal throttle and refrigeration

Description:

Attendance and class participation

Specific objectives:

2, 9, 10, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Fifth session of public presentations

Description:

The student makes a public presentation about the technical report developed

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Theory classes: 2h

Self study: 0h 48m

Debriefing course

Description:

Attendance and class participation

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 8h 12m

Theory classes: 6h

Self study: 2h 12m

take-home exam

Description:

The student solves at home a 16-question exam. Each question has a limited space for your answer. The answer should be concise, complete and correct

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Related competencies :

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 15h

Self study: 15h

Practice 1 in Reuse workshop

Description:

The student sets up a computer

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Guided activities: 2h

Self study: 0h 48m



2nd practice in Reuse workshop

Description:

The student repairs the assigned computers

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13

Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

Full-or-part-time: 2h 48m

Guided activities: 2h

Self study: 0h 48m

GRADING SYSTEM

A: 20% take-home exam

B: 40% report on the subject + public presentation

C: 10% practice in Reutilitza workshop

D: 30% individual work or teamwork done in class

The non-attendance at class or lack of punctuality subtracts a D grade to the extent that the personal work planned during the class is not performed.

Failure to submit the report or not making the public presentation involve a 0 in B.

The note from the skill "oral and written communication" is calculated from the technical report. The note of skill "Sustainability and social commitment" is calculated from technical report, the practice in the Reutilitza workshop and a special session about sustainability.

BIBLIOGRAPHY

Basic:

- Ujaldón, Manuel. Arquitectura del PC. Ciencia 3, 2003. ISBN 8495391864.

Complementary:

- Mueller, Scott. Upgrading and Repairing PCs. 21st ed. Que Publishing, 2013. ISBN 9780789750006.