

Course guide

270122 - PTI - Information Technology Project

Last modified: 30/01/2024

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: FELIX FREITAG

Others:

Primer quadrimestre:
FELIX FREITAG - 10, 11, 12
RUBÉN TOUS LIESA - 10, 11

Segon quadrimestre:
FELIX FREITAG - 11, 12
RUBÉN TOUS LIESA - 11, 12

REQUIREMENTS

- Pre-Corequisite ASO
- Pre-Corequisite PI

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CT2.3. To design, develop, select and evaluate computer applications, systems and services and, at the same time, ensure its reliability, security and quality in function of ethical principles and the current legislation and normative.

CT2.4. To demonstrate knowledge and capacity to apply the needed tools for storage, processing and access to the information system, even if they are web-based systems.

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.

CT6.1. To demonstrate knowledge and capacity to manage and maintain computer systems, services and applications.

CT6.4. To demonstrate knowledge and capacity to apply the characteristics, functionalities and structure of the Distributed Systems and Computer and Internet Networks guaranteeing its use and management, as well as the design and implementation of application based on them.

CT7.1. To demonstrate knowledge about metrics of quality and be able to use them.

CT7.2. To evaluate hardware/software systems in function of a determined criteria of quality.

CT7.3. To determine the factors that affect negatively the security and reliability of a hardware/software system, and minimize its effects.

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

CT11.3. To select, deploy, integrate and manage information system which satisfy the organization needs with the identified cost and quality criteria.

CT11.4. To select, design, deploy, integrate, evaluate, build, manage, exploit and maintain the hardware, software and network technologies, according to the adequate cost and quality parameters.

CT12.2. To administrate and maintain applications, computer systems and computer networks (the knowledge and comprehension levels are described in the common technical competences).

CT12.3. To demonstrate comprehension, apply and manage the reliability and security of the computer systems (CEI C6).

CT13.1. To conceive systems, applications and services based on network technologies, taking into account Internet, web, electronic commerce, multimedia, interactive services and ubiquitous computation.

CT13.2. To implement and manage ubiquitous systems (mobile computing systems).

CT13.3. To design, establish and configure networks and services.

CT13.4. To design communications software.

Generical:

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

TEACHING METHODOLOGY

The teaching methodology applied is project-based learning, in which in a group a project is developed during several weeks.

The work is focused on the activity of students, preparing individual and tasks in groups of 2 in the laboratory assignments and in groups of 4 in the the project.

The course is organized in a first phase of about 6 weeks with to several laboratory assignments and group work, and a second phase consisting of about 9 weeks in the development of a project group.

The practices of the first phase address separately how to install, configure, adapt and extend applications and systems of information technology. In the first phase a project proposal is elaborated (integration of concepts), consisting of the preparation, negotiation and writing of the project proposal (groups of 4 people negotiate with the teacher the project content in a structured and no class attending requiring form).

In the second phase, in groups of 4 people the students will define a project of information technology to develop and test for several weeks and to present the findings and conclusions to the whole class at the end of the course.

The main activities are:

- Classes participatory and group work.
- Laboratory assignments (groups of 2 people).
- Preparation of project proposal (group, semi).
- Development and presentation of a project (group of 4 people)

LEARNING OBJECTIVES OF THE SUBJECT

- 1.Prepare in group a proposal of an information technology project that includes timing and the division of tasks among group members.
- 2.Organize the work of developing the project with a group of people and monitor compliance with the planning and the allocation of tasks among group members.
- 3.Perform demos of systems and applications developed in the project.
- 4.Presenting the results of the project developed.
- 5.Install, configure and evaluate applications and systems of information technology.
- 6.Adapt and extend applications and systems of information technology.
- 7.Apply knowledge acquired in previous courses in drafting the proposal for a project of information technology and during its development, selecting applications, systems and appropriate services.
- 8.Develop a project group of technologies of information in accordance with a project proposal prepared earlier.

STUDY LOAD

Type	Hours	Percentage
Guided activities	6,0	4.00
Self study	84,0	56.00
Hours small group	57,0	38.00
Hours large group	3,0	2.00

Total learning time: 150 h

CONTENTS

Project development

Description:

Design, implementation and integration of hardware resources, software and networks in the development of a information technology project.



Project Organization

Description:

Managing a project (planning, monitoring, evaluating).

Technology assessment

Description:

Evaluate and select hardware and software platforms for running applications and computer services.

Distributed Applications

Description:

Systems, applications and services based on network technologies, taking into account the Internet, Web, e-commerce, multimedia, interactive services and ubiquitous computing.

Distributed Systems

Description:

Features and structure of distributed systems (inter-process communication, consistency and replication, fault tolerance and reliability, efficient management of resources, processing, storage and network and power / consumption).

ACTIVITIES

Course presentation

Description:

Understanding the course

Specific objectives:

1, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 3h

Laboratory classes: 2h

Self study: 1h

Infoday

Description:

Initial ideas for projects or project components are generated and presented

Specific objectives:

1, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 3h

Laboratory classes: 2h

Self study: 1h

Laboratory assignments

Description:

Laboratory assignments

Specific objectives:

5, 6, 7

Full-or-part-time: 0h 30m

Self study: 0h 30m

Case studies

Description:

Systems and applications are reviewed

Specific objectives:

1, 2, 5, 6, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 14h

Laboratory classes: 8h

Self study: 6h

Complementary practices to prepare the project proposal

Description:

Laboratory assignments in the area of □□information technology

Specific objectives:

1, 5, 6, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 25h

Laboratory classes: 10h

Self study: 15h

Laboratory assignments

Description:

Laboratory assignments

Specific objectives:

5, 6, 7

Full-or-part-time: 0h 30m

Self study: 0h 30m

Project proposal

Description:

Develop a written project proposal and a presentation with slides. A structure with an index that can help organize the proposal is provided, including technical description of the organization (starting point, objectives, tasks, results, distribution, roles, Gantt)

Specific objectives:

1, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 7h

Self study: 7h

Presentation of the project propose

Description:

Presentation with slides of the proposed project to the whole class.

Specific objectives:

1, 7

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 7h

Laboratory classes: 2h

Self study: 5h

Project proposal

Description:

Project proposal

Specific objectives:

1, 2, 4, 7, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

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Full-or-part-time: 2h

Self study: 2h

Project development

Description:

Each project group develops the proposed project. The deliverable includes slides, code and written documentation of the project.

Specific objectives:

2, 5, 6, 7, 8

Related competencies :

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 48h

Laboratory classes: 20h

Self study: 28h

Tracking project progress

Description:

Have meetings periodically with the teacher. Write a weekly progress report.

Specific objectives:

2, 4, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 6h

Laboratory classes: 4h

Self study: 2h

Presentation of project progress

Description:

Presentation with slide to the whole class to show the progress in the project.

Specific objectives:

2, 4, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 8h

Laboratory classes: 4h

Self study: 4h

Project Progress

Description:

Project Progress

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 2h

Self study: 2h

Demo Project

Description:

Each project group makes a demo of the project developed.

Specific objectives:

2, 3, 4, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 8h

Laboratory classes: 4h

Self study: 4h

Project demo

Description:

Project demo

Specific objectives:

3, 4, 5, 6, 7

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 2h

Self study: 2h

Final Project Presentation

Description:

Each project group makes a presentation with slides to the whole class. This presentation may include a brief demo of the project.

Specific objectives:

2, 3, 4, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 12h

Laboratory classes: 4h

Self study: 8h

Final Project Presentation

Description:

Final Project Presentation

Specific objectives:

1, 2, 3, 4, 5, 6, 7, 8

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.

G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

G1. ENTREPRENEURSHIP AND INNOVATION: to know and understand the organization of a company and the sciences which govern its activity; capacity to understand the labour rules and the relation between planning, industrial and business strategies, quality and benefit. To develop creativity, entrepreneur spirit and innovation tendency.

Full-or-part-time: 2h

Self study: 2h

GRADING SYSTEM

Marks of technical skills:

$$NF = 0,25 * PG + 0,60 * PR + 0,15 * SEG$$

where:

NF = Final mark of the course

PG = Guided laboratories

PR = Project

SEG = Participation

Marks generic skills:

$$NCT1 = 0,9 PR + 0,1 SEG$$

$$NCT2 = 0,8 PR + 0,2 PG$$

$$NCT3 = 0,7 PR + 0,3 PG$$

where:

NCT1 = Transversal skill INNOVATION AND BUSINESS

NCT2 = Transversal skill EFFECTIVE ORAL AND WRITTEN COMMUNICATION

NCT3 = Transversal skill TEAMWORK

PG = Guided laboratories (aspects related to the skills)

PR = Project (aspects related to the skills)

SEG = Participation (aspects related to the skills)

Be normalized to A, B, C or D (where A corresponds to a level excellent, B corresponds to a desired level, C corresponds to a sufficient level and D corresponds to an insufficient level).



BIBLIOGRAPHY

Basic:

- Kurose, J.F.; Ross, K.W. Computer networking: a top-down approach. 8th ed., global ed. Harlow, United Kingdom: Pearson Education Limited, 2022. ISBN 9781292405469.