Course guide
270132 - PAE - Applied Engineering 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

LECTURER

Coordinating lecturer:	DAVID ROVIROSA CALVET - MIREIA FAGEDA BERTRAN - JOSEP SOLE PARETA
Others:	Primer quadrimestre: PERE BARLET ROS - 12 MIREIA FAGEDA BERTRAN - 12 DAVID ROVIROSA CALVET - 12 JOSEP SOLE PARETA - 11, 12 Segon quadrimestre: PERE BARLET ROS - 10 MIREIA FAGEDA BERTRAN - 10 DAVID ROVIROSA CALVET - 10 JOSEP SOLE PARETA - 10

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.
CT3.6. To demonstrate knowledge about the ethical dimension of the company: in general, the social and corporative responsibility and, concretely, the civil and professional responsibilities of the informatics engineer.
CT8.1. To identify current and emerging technologies and evaluate if they are applicable, to satisfy the users needs.

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

La metodología docente que se aplica es la de aprendizaje basado en proyectos (Project-Based Learning). El principal objetivo es definir, especificar, implementar y defender un proyecto que de respuesta a un reto definido por una empresa. El reto incorpora un fuerte componente de innovación y para encontrar soluciones se seguirá la metodología Design-Thinking.

La asignatura esta organizada en tres fases, en la primera fase los estudiantes, en grupos de 4, plantearán, diseñarán y planificarán una solución al reto. En esta fase se elabora una propuesta de proyecto que consiste en la preparación y escritura de un documento que debe ser debatido con el profesor así como con la Empresa.

En la segunda fase el grupo implementará el proyecto, esta fase incluye reuniones de seguimiento con el profesorado, horas de consultoría técnica con expertos así como reuniones con la Empresa.

La tercera fase consiste en la defensa del proyecto incluyendo una presentación oral, una demostración así como la entrega del documento técnico del proyecto. Esta defensa se realizará ante los demás grupos, el profesorado y la Empresa.

LEARNING OBJECTIVES OF THE SUBJECT

1.Discuss, agree and prepare a project proposal with a group of students. Define the proposal with the appropriate scope.
2.Plan a project and manage the work among the team members.
3.Apply the knowledge learned during the studies to successfully design and implement an engineering project.
4.Choose the appropriate technologies to fulfill the requirements of the project proposal.
5.Demonstrate, present and defend a project.
6.Prepare and write the documentation of an engineering project.

STUDY LOAD

Type	Hours	Percentage
Hours small group	60,0	38.46
Self study	90,0	57.69
Guided activities	6,0	3.85

Total learning time: 156 h

CONTENTS

Creative Thinking

Description:
La Empresa actúa como cliente planteando un problema/reto. Los estudiantes deben plantear un producto/tecnología que solucione dicho problema.

System Thinking

Description:
Los estudiantes deben plantear un sistema completo, usualmente multi-disciplinar. La solución se negocia con la empresa

Engineering Design

Description:
Los estudiantes definirán un proyecto de ingeniería (Objetivos, Paquetes de Trabajo, Gantt, Deliverables, etc) que implementarán. La metodología de trabajo vendrá definida por la empresa.

Team Work

Description:
Los estudiantes desarrollarán las diferentes partes del sistema (adaptándose cuando sea posible a su especialidad) usando una metodología definida por la empresa. En esta fase se incluyen reuniones de seguimiento y deliverables que deben ser aprobados por la empresa.

Projecte defense

Description:
Los estudiantes demuestran y defienden su proyecto ante la Empresa

ACTIVITIES

Presentación de la asignatura

Specific objectives:
1, 2, 3, 4, 5, 6

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.
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.
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
Laboratory classes: 2h

Comprensió dels projectes de les empreses

Specific objectives:
1

Related competencies :
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

Debat dels projectes i formació dels grups

Specific objectives:
1, 2

Related competencies :
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: 5h
Laboratory classes: 4h
Self study: 1h

Preparació de les propostes de projecte

Specific objectives:
1, 2, 3, 4, 6

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.
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: 36h
Laboratory classes: 18h
Guided activities: 2h
Self study: 16h

Disseny tècnic a la solució al repte d'enginyeria

Specific objectives:
1, 2, 3, 4

Related competencies :
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: 18h
Laboratory classes: 6h
Self study: 12h

Presentación de la solución y debate

Specific objectives:
1, 2, 3, 4

Related competencies :
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
Guided activities: 2h
Self study: 12h

Consultoria tècnica/Engineering Design

Specific objectives:
1, 2, 3, 4

Related competencies :
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: 10h
Laboratory classes: 6h
Guided activities: 2h
Self study: 2h

Desenvolupament del projecte/Team-work

Specific objectives:
1, 2, 3, 4

Related competencies :
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: 34h
Laboratory classes: 16h
Guided activities: 2h
Self study: 16h

Seguiment del projecte

Specific objectives:
5

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.
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.
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: 14h
Guided activities: 2h
Self study: 12h

Defensa del projecte

Specific objectives:
5, 6

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.
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.
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: 14h
Guided activities: 2h
Self study: 12h

GRADING SYSTEM

Tipo de evaluación: Asignatura que se evalúa en período de exámenes

NF=0.25*Propuesta + 0.25 * Seguimiento + 0.5 * Defensa

Propuesta= Nota de la propuesta del proyecto

Seguimiento= Nota de la presentación de seguimiento del proyecto

Defensa= Nota de la defensa final del proyecto

Calificación de las competencias transversales:

NCT1 = 0,9 PR + 0,1 Propuesta
NCT2 = 0,8 PR + 0,2 Seguimiento
NCT3 = 0,7 PR + 0,3 Defensa

donde:

NCT1 = Nota Competencia Transversal EMPRENEDORIA I INNOVACIÓ
NCT2 = Nota Competencia Transversal COMUNICACIÓ EFICAÇ ORAL i ESCRITA
NCT3 = Nota Competencia Transversal TREBALL EN EQUIP

Se normalizará a A,B,C o D (donde A corresponde a un nivel excelente, B a un nivel bueno, C a uno suficiente y D corresponde a un nivel no superado).

BIBLIOGRAPHY

Basic:
- Cross, N. Design thinking: understanding how designers think and work. Berg, 2011. ISBN 9781847886361.

RESOURCES

Hyperlink:
- http://dschool.stanford.edu/dgift/