Course guide
270132 - PAE - Applied Engineering Project

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: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: PERE BARLET ROS

Others: Primer quadrimestre:
PERE BARLET ROS - 12
JOSEP SOLE PARETA - 11

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>57.69</td>
</tr>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>3.85</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>19.23</td>
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<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>19.23</td>
</tr>
</tbody>
</table>

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:**
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.
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**Full-or-part-time:** 3h
Laboratory classes: 2h
Self study: 1h

**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:** 3h
Laboratory classes: 2h
Self study: 1h
Preparació de les propostes de projecte

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

**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.

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:** 33h
Laboratory classes: 18h
Self study: 15h

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:** 23h
Laboratory classes: 8h
Self study: 15h

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:** 17h
Guided activities: 2h
Self study: 15h
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: 11h
Laboratory classes: 8h
Self study: 3h

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: 39h
Laboratory classes: 20h
Self study: 19h

Seguiment del projecte

Specific objectives:
5

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.
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Full-or-part-time: 12h
Guided activities: 2h
Self study: 10h
Defensa del projecte

Specific objectives:
5, 6

Related competencies:
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Full-or-part-time: 12h
Guided activities: 2h
Self study: 10h

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:

RESOURCES

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