



Course guide

230009 - ENTIC - Introduction to Ict Engineering

Last modified: 19/01/2024

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.
732 - OE - Department of Management.
744 - ENTEL - Department of Network Engineering.
739 - TSC - Department of Signal Theory and Communications.

Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Compulsory subject).

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

LECTURER

Coordinating lecturer: Consultar aquí / See here:
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura>

Others: Consultar aquí / See here:
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma>

PRIOR SKILLS

Basic laboratory instrumentation (power supply, multimeter and oscilloscope)
Basic electronic components (resistors and capacitors)
Basic programming

REQUIREMENTS

LINEAR CIRCUITS AND SYSTEMS - Precorequisite
OBJECT ORIENTED PROGRAMMING - Precorequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:

1. ABILITY TO CONCEIVE, DESIGN, IMPLEMENT AND OPERATE COMPLEX ICT SYSTEMS. Level 1. To identify the processes involved in the life cycle of a product, process or service and the functions of engineering. To assess the need for a systematic design process. To identify and perform the steps of a product design specification document (PDS). To complete and improve planning and specification documents. To apply a systematic design process in the stages of implementation and operation. To prepare progress reports of a design process. To handle support tools for project management. To prepare a final report for a simple design process. To understand the basic economic aspects associated with the product, process or service that is being designed.

11 CDION1. They will be able to apply a comprehensive view of the entire life cycle (conception, design, implementation and operation) of a product, process or service in the ICC field, and identify users' needs and develop a set of requirements for the product, process or service and a set of initial specifications. They will be able to explore possible solutions and select the best one. They will be able to carry out a design process following a standardised methodology. They will know how to evaluate and propose improvements to the design. They will take into account economic and social aspects of the project or product.

Transversal:

2. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.

3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

TEACHING METHODOLOGY

Group work (learning)
Individual (learning)
exercises
oral presentation
Short answer tests (control)

LEARNING OBJECTIVES OF THE SUBJECT

- Introduce economic aspects of the processes of production and marketing of products and services in the ICT field
- Introduce and motivate students to study engineering
- Expose them to the design and construction of systems
- Introduce them to the project methodology
- Provide experiences that help to consolidate or prior knowledge of the subjects taught in parallel and relate them to the economic

Learning outcomes:

Properly known concept of enterprise, and acquired basic knowledge about their institutional and legal framework. Acquired basic knowledge about business organizations and knows the tools to do basic calculations associated costs of products and services processes and profitability.

Recognizes the ethical, social and environmental engineering professional activity in the field of ICT.

Plans and conducts an oral presentation respond appropriately to the questions formulated and drafted properly basic texts.

Identify the goals of the group and can draw a work plan for achieving them. Identifies the responsibilities of each group member and committed to the task assigned.

Apply a systematic design process phases of implementation and operation. Prepares progress reports and final. Learn about the basic economic aspects related to the product-process-service is being designed.

STUDY LOAD

Type	Hours	Percentage
Self study	85,0	56.67
Hours large group	26,0	17.33
Hours small group	39,0	26.00

Total learning time: 150 h

CONTENTS

Concepts of project management, business and economics

Description:

Introduction to the project management methodology and study of its economic viability. Definition and typologies.

Methodologies for managing the project. Management documentary. Time planning. Teamwork management.

Business and ICT business models. Types of ICT products and services. Case study.

Determination of product and / or service costs. Types of costs. Conventional cost systems: direct costs and full costs. Practical assumption.

Investment analysis. Characteristics of an investment. The value of money over time. Static and dynamic methods of profitability analysis. Practical assumption.

Oral and Written Communication: Basic knowledge of both oral and written communication. Importance of communication on a personal, interpersonal and organizational level. Upon completion of the course, the student is able to communicate effectively both orally and in writing at level 1 of the competency.

Social and environmental commitment: Basic knowledge of the social and environmental impact of engineering in the field of ICT, democratic values and Equal opportunities for women and men. Relationship of ICT with the SDGs.

Knowledge of regional, state and European regulations, including those related to sustainability. The code of ethics and the main ethical issues related to the profession are also made known.

Related competencies :

02 SCS N1. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

01 EIN N1. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.

Full-or-part-time: 60h

Theory classes: 26h

Self study : 34h

(ENG) Projecte.

Description:

Design and partial implementation of a complex system that includes various ICT systems through a project partially guided in small groups (4).

Specific objectives:

Implement the concepts worked and seminars on the topics of the course, reinforcing specific skills from previous courses and acquire parallel the learning outcomes expected for generic skills. I mainly worked on concepts (implementation) and O (operate) with an introduction to the design (D).

Related activities:

Implementation of the electromechanical system that constitutes the platform of the project (underwater vehicle, robot ...) Partial design of measurement systems (conditioning of sensor signals, acquisition), transmission of information (physical signals, basic protocols) and processing and analysis of the information collected (calibration, graphical representation). Task management (resource and time planning) and project documentation (specifications, plan, progress reports, final report, non-financial report of environmental and social impacts and possible related ethical issues).

Related competencies :

09 CSCT N1. ABILITY TO CONCEIVE, DESIGN, IMPLEMENT AND OPERATE COMPLEX ICT SYSTEMS. Level 1. To identify the processes involved in the life cycle of a product, process or service and the functions of engineering. To assess the need for a systematic design process. To identify and perform the steps of a product design specification document (PDS). To complete and improve planning and specification documents. To apply a systematic design process in the stages of implementation and operation. To prepare progress reports of a design process. To handle support tools for project management. To prepare a final report for a simple design process. To understand the basic economic aspects associated with the product, process or service that is being designed.

02 SCS N1. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

Full-or-part-time: 90h

Laboratory classes: 39h

Self study : 51h

GRADING SYSTEM

LAB PROJECT TRACK

-Part A Lab-Project

(includes mid term exam)=30%

-Part B Lab-Project=30 %

PROJECT MANAGEMENT TRACK

-Sustainability Report= 5%

-Business Case Report=15 %

-Business Case Presentation=10 %

-Mid Term Exam=10 %

BIBLIOGRAPHY

Basic:

- Ulrich, K.T.; Eppinger, S.D.; Yang, M.C. Product design and development. 7th ed. New York, NY: McGraw-Hill Education, 2019. ISBN 9781260566437.