Universidad Zaragoza

Year : 2019/20

30130 - Economic Engineering

Syllabus Information

Academic Year: 2019/20
Subject: 30130 - Economic Engineering
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering
ECTS: 6.0
Year: 3
Semester: Second semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

The subject and its expected results respond to the following approaches and objectives:

It aims to interest the student in a characteristic and distinctive element of engineering such as decision-making between different alternatives.

In this context it is essential to make economic estimates, for which historical data can be used, but what is relevant is the data expected in the future.

For this purpose, cost elements, financial mathematics and technologies for digital transformation, among others, are studied.

1.2.Context and importance of this course in the degree

The degree of Industrial Organization Engineering has a strong management component among which it is considered that should be the skills of the graduate. It is therefore the objective of the degree to provide the student with competencies for making business decisions or, in general, organizational and management decisions in organizations that must relate to the business environment. This advises the existence of disciplinary contents that, beyond instructing in managerial skills, offer knowledge of cost analysis, financial operations and skills in the handling of technologies to help decision making.

1.3.Recommendations to take this course

In order to take the course, it is recommended to have a basic knowledge of Economics and Business Administration.

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree,

students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The current subject Economic engineering is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, the solving of problems or resolution of questions and laboratory work, at the same time supported by other activities.

The organization of teaching will be carried out using the following steps:

- **Lectures**: Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.
- **Practice Sessions**: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Laboratory Workshop**: The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.
- **Individual Tutorials**: Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

4.2.Learning tasks

The programme offered to the student to help them achieve their target results is made up of the following activities...

Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

- **Face-to-face generic activities**:

Theory Classes: The theoretical concepts of the subject are explained and illustrative examples are developed as a support to the theory when necessary.

Practical Classes: Problems and practical cases are carried out, complementary to the theoretical concepts studied.

Laboratory Workshop: This work is tutored by a teacher, in groups of no more than 20 students.

- **Generic non-class activities**:

Study and understanding of the theory taught in the lectures.

Understanding and assimilation of the problems and practical cases solved in the practical classes.

Preparation of seminars, solutions to proposed problems, etc.

Preparation of laboratory workshops, preparation of summaries and reports.

Preparation of the written tests for continuous assessment and final exams.

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the subject file in the Accreditation Report of the degree, taking into account the level of experimentation considered for the said subject is moderate.

Activity	**Weekly school hours**
Lectures	3
Laboratory Workshop	1
Other Activities	6

Nevertheless, the previous table can be shown in greater detail, taking into account the following overall distribution:

- 35 hours of lectures, with 50% theoretical demonstration and 50% solving type problems.
- 17 hours of laboratory workshop, in 1 or 2-hour sessions.
- 8 hours of written assessment tests, one hour per test.
- 90 hours of personal study, divided up over the 15 weeks of the 2nd semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

4.3.Syllabus

The course will address the following topics:

CONTENTS 1. THEORETICAL

- 1.- BASICS, FINANCIAL TERMS

- 1.1. Role of Economic Engineering
    - 1.2. Interest equivalence
    - 1.3. Simple interest
    - 1.4. Compound interest
- 2.- FACTORS OF PAYMENT AND USE
    - 2.1. present value, future value and its value uniform
    - 2.2. Calculation of number of years unknown
    - 2.3. nominal and effective rates
    - 2.4. Payment calculations for different periods of the compounding periods
- 3. INVESTMENT ALTERNATIVES TEMA.-
    - 3.1. Present value and capitalized cost
    - 3.2. equivalent uniform annual value
    - 3.3. Return rate for a single project
    - 3.4. Benefit / cost
- 4.- METHODS AND DEPLETION DEPRECIATION
    - 4.1. linear depreciation
    - 4.2. Growing balance
    - 4.3. System modified accelerated cost recovery
    - 4.4. Determination of the recovery period
    - 4.5. Method exhaustion
- 5.- MANAGEMENT COSTS
    - 5.1. Expense, cost, payment and investment
    - 5.2. Cost classification
    - 5.3. Costing systems
        - 5.3.1. Direct and indirect costs
            - 5.3.1.1. Direct treatment costs and allocation of indirect
        - 5.3.2. variable costs
        - 5.3.3. Allocation of indirect costs of manufacturing orders
    - 5.4. Complete systems for process costs
    - 5.5. Complete systems costs by sections
    - 5.6. activity-based cost (ABC)
    - 5.7. Quality costs and quality not
- 6. DEVELOPMENT AND BUDGET CONTROL
    - 6.1. Sales Budget
    - 6.2. Budget costs
    - 6.3. Cash budget
- 7. PRODUCTIVITY INDICATORS
    - 7.1. Debt indicators.
    - 7.2. Indicators of profitability and productivity.
    - 7.3. Indicators of economic situation.
    - 7.4. Indicators of capacity to pay.

2. PRACTICAL CONTENT
Each topic discussed in the previous section has associated practices in this regard, whether by practical cases, interpretation and commentary on the topic leading to associated obtaining results and their analysis and interpretation. As topics are developed it will pose such practices, either in class or through the Moodle platform.

4.4.Course planning and calendar

Schedule sessions and presentation of works

In the following table, the indicative schedule which includes the development of the activities presented above may vary depending on the educational activity is shown.

- Sessions 1.2 Basic Financial Concepts
- Factors 3,4,5 payment session. Delivery practices 1
- Sessions 6,7,8,9,10 Investment alternatives
- Sessions 11.12 depreciation methods. Delivery of Practice 2

- Sessions 13.14 Sensitivity analysis and decisions expected value
- Sessions 15 First partial exam. Delivery of Practice 3
- Sessions 16 Cost accounting
- Sessions 17,18,19 partial or direct costs. Delivery Practice 4
- Sessions 20 Costs per order
- Sessions 20,21 full session costs per process. Delivery Practice 5
- Session Complete sections 25,26,27 costs
- Session 28 Development and budgetary control. Delivery Practice 6
- Session 29 Productivity Indicators
- Session 30 Second midterm exam session. Practical delivery in July

The weekly schedule of the subject will be published at
http://www.eupla.unizar.es/asuntos-academicos/calendario-y-horarios

The dates of the global evaluation test (**official calls**) will be published at
http://www.eupla.unizar.es/asuntos-academicos/examenes

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=30130&year=2019