GENERAL INFORMATION

Course information	
Name	Economy of the Electric Power Industry
Code	ECO
Degree	Master in the Electric Power Industry (MEPI)
Year	2022-23
Semester	1st
ECTS credits	6 ECTS
Type	Required
Coordinator	José Pablo Chaves Ávila

Instructor	
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DETAILED INFORMATION

Contextualization of the course

Contribution to the professional profile of the degree

The objective of the course is to become familiar with electric power systems' microeconomic and financial fundamentals. The concepts presented in this course will set the foundations for properly understanding stakeholders' decision-making processes in the electricity industry.

Prerequisites

There are no prerequisites for this course. The course assumes the student is not familiar neither with microeconomics nor with financial analysis.

CONTENTS

Competences and Learning Outcomes

Competences

Basic Competences

CB2 Being able to apply and integrate the knowledge, their comprehensiveness, the scientific founding, and their abilities to solve problems in new environments and defined in an imprecise manner, including multidisciplinary contexts as highly qualified researchers and professionals.

Specific Competences

CE7 Being able to transfer theoretical concepts of Microeconomics to the study and analysis of the real markets.

CE8 Understand the accounting and financial regime of a company and know the general mechanisms for settlement of the sector. To be able to realize the investment analysis in an electricity company and understand the main aspects of strategic management of the sector.

Learning outcomes

By the end of the course, students should be able to:

LO1. Understand the drivers behind demand and supply behaviour.

LO2. Understand the efficiency gains a market environment can achieve,

LO3. Understand why the market does not always do its job. In this respect, the student will be able to identify the most relevant market failures affecting electricity markets

LO4. Understand the most relevant financial concepts, with a particular focus on the electricity industry.

LO5. Use some well-known techniques and methods aimed to analyze electricity companies' financial position.

LO6. Understand the electricity company's strategy

TEACHING METHODOLOGY

General methodological aspects of the course	
Classroom Methodology: Activities	**Competences**
Lectures. Description of the course contents and open discussion of concepts. The students also have to try to respond to the numerous questions posed by the instructors throughout the lecture (54 hours).	**CB2, CE7, CE8**
Oral presentations. The students have to discuss the most relevant aspects of their work (6 hours).	**CB2**
Tutorial activities. Available according to the need of the student. (5 hours)	**CB2, CE7, CE8**
Non-Classroom Methodology: Activities	**Competences**
The classroom activity should be complemented by the individual student work performed out of class.	
Personal study. Study of the course contents (90 hours).	**CB2, CE7, CE8**
Term task. The student has to apply the theoretical concepts reviewed in class real cases (25 hours).	**CB2**

GRADING

There are five blocks in the course. Each of these blocks has a different instructor and a different grading system (described below). The total grade of the course will be the weighted average of the five parts, where each part gives weights in the weights of sessions.

To pass the course in the regular assessment period, a minimum grade of 3,5 (out of 10) in each of the five parts will be needed, and an average equal to or above 5.

In case the student does not pass the course, the final grade in the regular assessment period will be the lowest of the five marks, and the student will have to retake all the blocks with less than 5 points (the grade corresponding to blocks with 5 or more points will be maintained). After the retake, the total grade of the course will again be the weighted average of the five parts, where each part gives weights concerning the sessions.

3.1 Grading in the regular assessment period:

Block 1: Microeconomics

Evaluation activities	Evaluation Criteria	Weight
Exams Exams are a combination of short questions, multi-option tests and problems.	- Concept understanding - Application of concepts to the solution of practical problems	**90 %**
Participation in the class	- Contribution to the class discussions	**10%**

Block 2: Financial Statements Analysis

Evaluation activities	Evaluation Criteria	Weight
Exam Exams are a combination of short questions, multi-option tests and problems.	- Concept understanding - Application of concepts to the solution of practical problems	**80%**
Participation in the class	- Contribution to the class discussions	**10%**
Business case • Analysis of a real business case.	- The team task will be evaluated based on the quality of the analysis and the application of the concepts introduced in class.	**10%**

Block 3: Cost and Return Analysis

Evaluation activities	Evaluation Criteria	Weight

Exam Exams are a combination of short questions and multi-option tests.	- Concept understanding - Application of concepts to the solution of practical problems	**90 %**
Participation in the class	- Contribution to the class discussions	**10%**

Block 4: Electricity Industry Financing

Evaluation activities	Evaluation Criteria	Weight
Exam Exams are a combination of short questions, multi-option tests and problems.	- Concept understanding - Application of concepts to the solution of practical problems	**90 %**
Participation in the class	- Contribution to the class discussions	**10%**

Block 5: Strategy in the Electricity Sector

Evaluation activities	Evaluation Criteria	Weight
Participation in the class	- Contribution to the class discussions	**35%**
Business case	The final case presentation will be evaluated from two points of view: - The quality of the analysis itself, the clarity and the comprehensiveness of the assessment. - The oral presentation of the work, the way the students build up their discussions and their ability to back their proposals and respond to the questions received.	**65%**

Overall course grading

Evaluation activities	Evaluation Criteria	Weight
Exams Exams are a combination of short questions, multi-option tests and problems.	- Concept understanding - Application of concepts to the solution of practical problems	**70%**

Participation in the class	- Contribution to the class discussions	**15%**
Business case Analysis of a real business case.	- The team task will be evaluated based on the quality of the analysis and the application of the concepts introduced in class.	**15%**

3.2 Retake

Retakes

In case the student does not pass the course in the regular period, she/he will have to retake all blocks with an individual grade below 5 points. The dates of the retake evaluation period will be announced on the web page. The grading system of each block in the retake is described below.

Each of the five chapters (parts) will have the following grading system in the corresponding retake:

- Block 1 (Microeconomics): exam (100%)
- Block 2 (Financial Statements Analysis): exam (100%)
- Block 3 (Cost and Return Analysis): exam (100%)
- Block 4 (Electricity Industry Financing): exam (100 %)
- Block 5 (Strategy): case presentation (100 %).

A minimum grade of 3,5 (out of 10) in each of the five parts will be needed to pass the course. As in the regular assessment period, the average mark must be at least 5 out of 10 points (the grade corresponding to the blocks with 5 or more points in the regular period will be maintained to compute the average). Otherwise, the final grade will be the lowest of the five marks.

WORK PLAN AND SCHEDULE[1]

Class	Content
1	Introduction to the course - Introduction to Microeconomics
2	Microeconomic analysis of the electric power industry - Demand and supply (i)
3	Microeconomics analysis of the electric power industry - Demand and Supply (ii)
4	Microeconomics - Centralized context (i)
5	Microeconomics - Centralized context (ii)
6	Microeconomics - Perfect competitive markets
7	Monopoly
8	Test

[1] A detailed work plan of the subject can be found in the course summary sheet (see the last pages).

9	Economic and Financial Return. Value Creation and Financial Leverage
10	Economic and Financial analysis. Ratios
11	Case studies
12	Generation and distribution costs. Discounted cash flow valuation.
13	Financial statements. Structure of balance sheet and income statement.
14	Balance sheet analysis: assets, equity and liabilities
15	Income statement analysis: revenues & expenses
16	Cash flow statement analysis
17	Case studies
18	Intro. Objectives and financial policies
19	Financial needs and working capital management
20	Cost of capital. Optimal financial structure
21	Alternatives for financing. Risk management (1/2)
22	Risk Management (2/2). Project Finance and non-recourse debt
23	Industry Valuation. Analysis of electricity industry by Financial Markets
24	Exam Finance
25	Introduction to strategy in the electric power industry
26	Value innovation. Business plan
27	Strategy in the electric power industry (1)
28	Strategy in the electric power industry (2)
29	Strategy in the electric power industry (3)
30	Case presentations

SCHEDULE

SUMMARY OF WORKING HOURS OF THE STUDENT			
CLASSROOM HOURS			
Lectures	**Oral presentations**		
54	6		
NON-CLASSROOM HOURS			
Personal study	**Personal work in case studies**	**Tutoring**	
95	25	5	
		ECTS CRÉDITS:	**6 (180 hours)**

BIBLIOGRAPHY

Basic bibliography

- Presentations provided by the instructors

Complementary bibliography

Microeconomics

- 2013, I.Pérez-Arriaga “Regulation of the Power Sector”. Chap. 2,“Power System Economics“, M.Ventosa, P.Linares,I.Pérez-Arriaga
- 1986, Samuelson and Nordhaus, “Economics”

- 2005, Viscusi, Harrinton & Vernon “Economics of Regulation and Antitrust
- 1992, Varian, “Microeconomic Analysis”
- 1990, Tirole, “The Theory of Industrial Organization”

Financial Analysis

- 1999, G. Bennett Stewart III “The Quest for Value”
- 2010, Mckinsey & Company, “Valuation, Measuring and Managing the Value of Companies”.
- 2000, Richard A. Brealey and Stewart C. Myers, “Principles of Corporate Finance”.
- Aswath Damodaran, “Applied Corporate Finance: A User’s Manual”.
- 2003, Anthony Rice, “Account Demystified”, Pearsons education

Strategy

- 2008, David J. Collis and Michael G. Rukstad, “Can You Say What Your Strategy Is?” HBR 2008
- 2004, W. Chan Kim, Renée Mauborgne, “Value Innovation - The Strategic Logic of High Growth”, , HBR 2004
- 2007, Robert S. Kaplan and David P. Norton “Using the Balanced Scorecard as a Strategic Management System”, July–August 2007
- 2003, Paul M. Healy and Krishna G. PalepuPaper, “The Fall of Enron”, Journal of Economics Perspectives, Volume 17, Number 2. (Spring 2003), pp. 3-26; Up to page 10
- 2010, McKinsey, “The five types of successful acquisition”, McKinsey on Finance Number 36, Summer 2010

WORK PLAN (i/ii)

			In-class activities			Out of Class activities			Learning outcomes	
h/w	Class	Content	Lecture and problem solving	Assessment	h/w	Self-study	Problem solving	Individual and in-group assignments	Learning outcomes	Description
4	1	Introduction to the course - Introduction to Microeconomics			6	Review and self-study			LO1	Introduction to the course
	2	Demand and supply (i)							LO1	Introduction to Economics and to general principles of Microeconomics
4	3	Demand and supply (ii)			6				LO1	Understand supply and demand diagrams Introduce demand and supply elasticity. Consumer and producer surplus
	4	Economics in the centralized context (i)				Review and self-study			LO1	Understand supply and demand diagrams Introduce demand and supply elasticity. Consumer and producer surplus
4	5	Economics in the centralized context (ii)	Problem solving		6	Review and self-study	Problem solving		LO1	The all-knowing, all-powerful perfect benevolent planner. The concept of net social welfare
	6	Perfect competitive markets	Problem solving						LO2	The all-knowing, all-powerful perfect benevolent planner. The concept of net social welfare
4	7	Monopoly	Problem solving		6				LO2, LO3	Characterization of a perfect competitive market Analysis of supply and demand equilibrium in the electricity markets
	8	Test		Exam		Review and self-study	Problem solving		LO3	Imperfect competition and monopolies. Oligopolistic models and market agent's behavior in oligopolistic markets. Market power indexes. Final Text.
4	9	Economic and Financial Return. Value Creation and Financial Leverage			6				LO4, LO5	The Electricity Business: Departing from UNESA's income account a description of the main cost items of the electricity business is made for both operating and capital costs
	10	Economic and Financial analysis. Ratios				Review and self-study			LO4, LO5	Ratios: the use of financial ratios by the financial analysis is explained. The notions of financial leverage and value creation are introduced
4	11	Generation and distribution costs. Discounted cash flow valuation.			6				LO4, LO5	The time value of money is introduced to explain the discounted cash flow methodology. Application to the case of a generation plant and to a distribution network. The link between this methodology and the analysis usually performed by financial analysis is explained.
	12	Case studies				Review and self-study			LO4, LO5	Case studies: the previously explained concepts and analytical tools are applied to the consolidated financial statements of a relevant electricity group of companies.
4	13	Financial statements. Structure of balance sheet and income statement.	Problem solving		6		Problem solving	Case study	LO4, LO5	Introductory session to the Financial Statements: information contained, different types, basic principles used to prepared them, objectives and main users. Preliminary analysis of the structure and basic concepts of the Balance Sheet and the Income Statement.
	14	Balance sheet analysis: assets, equity and liabilities	Problem solving			Review and self-study			LO4, LO5	Different types of balance Sheet. Practical approach, analysing Iberdrola's Financial Statement
4	15	Income statement analysis: revenues & expenses			6				LO4, LO5	Analysis of the Income Statement, Study of the different margins shown in an Income Statement: contribution margin, EBIDTDA, EBIT, EBT and Net Result.
	16	Cash flow statement analysis				Review and self-study			LO4, LO5	Basic concepts and methods to prepare a Cash Flow Statement, Review of the different kinds of Cash Flows. Free Cash Flows and Net Cash Flow. Analysis of Iberdrola's Cash Flow.

WORK PLAN (ii/ii)

				In-class activities			Out of Class activities			Learning outcomes	
Week	h/w	Class	Content	Lecture and problem solving	Assessment	h/w	Self-study	Problem solving	Individual and in-group assignments	Learning outcomes	Description
9	4	17	Case study		Case studies	6	Review and self-study			LO4, LO5	Case studies: the previously explained concepts and analytical tools are applied to the consolidated financial statements of a relevant electricity group of companies.
		18	Intro. Objectives and financial policies							LO4, LO5	The time value of money is introduced to explain the discounted cash flow methodology. Application to the case of a generation plant and to a distribution network. The link between this methodology and the analysis usually performed by financial analysis is explained.
10	4	19	Financial needs and working capital management			6	Review and self-study			LO4, LO5	The objective of the firm, the positioning of the financial function within the company and the strategic decisions of financial management (investment, financial infrastructure, dividend, financial communication).
		20	Cost of capital. Optimal financial structure							LO4, LO5	The cost of the financial resources used by the company (WACC). Optimal financial structure. Rating Agencies and the rating process.
11	4	21	Alternatives for financing. Risk management (1/2)			6	Review and self-study			LO4, LO5	Financial Planning Process (short and long term). Working Capital Management. Banking instrument for the short term financial management.
		22	Risk Management (2/2). Project Finance and non-recourse debt							LO4, LO5	The relationship bank-company. Alternatives for funding the company (long term), including equity, banking products and capital markets. Financial Derivatives. The risk management process.
12	4	23	Industry Valuation. Analysis of electricity industry by Financial Markets			6	Review and self-study			LO4, LO5	Analysis and valuation of electricity companies by financial markets: Quantitative and Qualitative analysis. Different methods used to valuate a company/project. Valuation using dynamic models (cash flow discount).
		24	Exam Finance		Exam					LO4, LO5	Exam
13	4	25	Introduction to strategy in the electric power industry			6	Review and self-study			LO4, LO5	Key concepts of Business Unit Strategy. Readings & Discussion: What is strategy?
		26	Business models in the electricity industry						Case study	LO6	Strategy and Financial Statements Review of financial statement analysis- relationship with strategy.
14	4	27	Build, borrow or buy (I)			6	Review and self-study			LO6	Business Plans. Readings & Discussion: How to write a great business plans.
		28	Build, borrow or buy (II)							LO6	Mergers & Acquisitions. Readings & Discussion: Making Acquisitions, Valuation Methods.
15	4	29	Strategy in the electric power industry			6	Review and self-study			LO6	
		30	Case presentations		Presentations					LO6	