

GENERAL INFORMATION

Course information	
Name	Economy of the Electric Power Industry
Code	ECO
Degree	Master in the Electric Power Industry (MEPI)
Year	2017-18
Semester	1 st
ECTS credits	6 ECTS
Type	Required
Department	-
Area	-
Coordinator	Pablo Rodilla Rodríguez

Instructor	
Name	Pablo Rodilla Rodríguez
Department	IIT
Area	RYE (Regulation and Energy Economics)
Office	D-501 (Santa Cruz de Marcenado, 26)
e-mail	pablo.rodilla@iit.comillas.edu
Phone	91-542 28 00 ext: 2745
Office hours	Arrange an appointment through email.

Instructor	
Name	Jesús Pinelo Jimenez
Company	Ferrovial
Area	Internal Audit
Office	-
e-mail	jesuspino@hotmai.com
Phone	-
Office hours	Arrange an appointment through email.

Instructor	
Name	Ignacio Martinez del Barrio
Company	UNESA
Area	Financial Analysis
Office	
e-mail	imartinez@unesa.es
Phone	
Office hours	Arrange an appointment through email.

Instructor	
Name	Eloy Prieto Monterrubio
Company	Gas Natural Fenosa
Area	
Office	
e-mail	eprieto@gasnaturalfenosa.com
Phone	
Office hours	Arrange an appointment through email.

Instructor	
Name	José Luis Castro Pérez-Manzucó
Company	Iberdrola
Area	
Office	
e-mail	castroj@ibdl.com
Phone	-
Office hours	Arrange an appointment through email.

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 the proper understanding of stakeholders' decision-making process in the electricity industry.
Prerequisites
There are not prerequisites for this course. The course assumes the student is not familiar neither with microeconomics nor with financial analysis.

CONTENTS

Contents
Theory
Chapter 1. Microeconomic Analysis of the Electric Power Industry
<ul style="list-style-type: none"> 1.1 Demand and supply 1.2 Centralized context 1.3 Perfect competitive markets 1.4 Monopoly 1.5 Oligopoly
Chapter 2. Financial Statements Analysis
<ul style="list-style-type: none"> 2.1 Financial statements. Structure of balance sheet and income statement 2.2 Balance sheet analysis: assets, equity and liabilities 2.3 Income statement analysis: revenues & expenses 2.4 Cash flow statement analysis 2.5 Case study
Chapter 3. Costs and Return Analysis
<ul style="list-style-type: none"> 3.1 Economic and Financial analysis. Ratios 3.2 Economic and Financial returns. Case studies. 3.3 Generation costs. Discounted cash flow valuation. 3.4 Distribution costs, Cost structure of the Electricity business. Capital cost analysis
Chapter 4. Electricity Industry Financing
<ul style="list-style-type: none"> 4.1 Introduction. Objectives and financial policies. 4.2 Cost of Capital. Optimal financial structure 4.3 Financial needs and working capital management 4.4 Alternatives for financing. Risk analysis and risk management 4.5 Analysis and valuation of electricity companies by financial markets
Chapter 5. Strategy in the Electricity Sector
<ul style="list-style-type: none"> 5.1 Introduction to strategy in the electric power industry 5.2 Value innovation. Business plan 5.3 Strategy in the electric power industry 5.4 Case presentations

Competences and Learning Outcomes

Competences

Basic Competences

CB2 Saber aplicar e integrar sus conocimientos, la comprensión de estos, su fundamentación científica y sus capacidades de resolución de problemas en entornos nuevos y definidos de forma imprecisa, incluyendo contextos de carácter multidisciplinar tanto investigadores como profesionales altamente especializados.

Specific Competences

CE7 Ser capaz de trasladar los conceptos teóricos de la microeconomía al estudio y análisis de los mercados eléctricos reales.

CE8 Comprender el régimen contable y financiero de una empresa y conocer los mecanismos habituales de liquidaciones en el sector, así como ser capaz de realizar análisis de inversiones en una empresa eléctrica y comprender los principales aspectos de gestión estratégica del sector eléctrico

Learning outcomes

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

- LO1. Understand the drivers behind demand and supply behavior.
- 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
<p>Lectures. Description of the course contents and open discussion of concepts. The students have also to try to respond to the numerous questions posed by the instructors throughout the lecture (56 hours).</p> <p>Oral presentations. The students have to discuss with the instructors the most relevant aspects of their work (6 hours).</p> <p>Tutorial activities. Available according to the need of the student. (up to 10 hours)</p>	<p>CB2, CE7, CE8</p> <p>CB2</p> <p>CB2, CE7, CE8</p>
Non-Classroom Methodology: Activities	Competences
<p>The classroom activity should be complemented by the individual student work performed out of class.</p> <p>Personal study. Study of the course contents (95 hours).</p> <p>Term task. The student has to apply the theoretical concepts reviewed in class on real cases (25 hours).</p>	<p>CB2, CE7, CE8</p> <p>CB2</p>

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 weights are given by each part in proportion of sessions.

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

In case that 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). The total grade of the course after the retake will again be the weighted average of the five parts, where weights are given by each part in proportion of sessions.

3.1 Grading in the regular assessment period:

Block 1: Microeconomics

Evaluation activities	Evaluation Criteria	Weight
<u>Exams (2)</u> Exams is a combination of short questions, multi-option test and problems.	- Concept understanding - Application of concepts to the solution of practical problems	90 % (20 % and 70 %)
<u>Participation in the class</u>	- Contribution to the class discussions	10%

Block 2: Financial Statements Analysis

Evaluation activities	Evaluation Criteria	Weight
<u>Exam</u> Exams is a combination of short questions, multi-option test and problems.	- Concept understanding - Application of concepts to the solution of practical problems	70 %
<u>Participation in the class</u>	- Contribution to the class discussions	15%
<u>Business case</u> <ul style="list-style-type: none"> Analysis of a real business case. 	- The term task will be evaluated based on the quality of the analysis and the application of the concepts introduced in class.	15%

Block 3: Cost and Return Analysis

Evaluation activities	Evaluation Criteria	Weight
-----------------------	---------------------	--------

<p><u>Exam</u> Exams is a combination of short questions, multi-option test and problems.</p>	<ul style="list-style-type: none"> - Concept understanding - Application of concepts to the solution of practical problems 	90 %
<p><u>Participation in the class</u></p>	<ul style="list-style-type: none"> - Contribution to the class discussions 	10%

Block 4: Electricity Industry Financing

Evaluation activities	Evaluation Criteria	Weight
<p><u>Exam</u> Exams is a combination of short questions, multi-option test and problems.</p>	<ul style="list-style-type: none"> - Concept understanding - Application of concepts to the solution of practical problems 	100 %

Block 5: Strategy in the Electricity Sector

Evaluation activities	Evaluation Criteria	Weight
<p><u>Participation in the class</u></p>	<ul style="list-style-type: none"> - Contribution to the class discussions 	40%
<p><u>Final case presentation</u></p>	<p>The final case presentation will be evaluated from two points of view:</p> <ul style="list-style-type: none"> - The quality of the analysis itself, the clarity and 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 to respond to the questions received. 	60%

3.2 Retake

Retakes
<p>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</p>

announced in the web page. The grading system of each block in the retake are those described below.

Each of the five chapters (parts) will have a different 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 %).

In order to pass the course it will be needed a minimum grade of 3,5 (out of 10) in each of the five parts. As in the regular assessment period, in order to pass the course, 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 SCHEDULE¹

Class	Content
1	Introduction to the course - Introduction to Microeconomics
2	Demand and supply (i)
3	Demand and supply (ii)
4	Economics in the centralized context (i)
5	Economics in the centralized context (ii)
6	Perfect competitive markets (i) and test
7	Perfect competitive markets (ii)
8	Monopoly and oligopoly (i)
9	Monopoly and oligopoly (ii) and test
10	Financial statements. Structure of balance sheet and income statement.
11	Balance sheet analysis: assets, equity and liabilities
12	Income statement analysis: revenues & expenses
13	Cash flow statement analysis
14	Case study (1)
15	Case study (2) and test
16	Economic and Financial analysis. Ratios
17	Economic and Financial returns. Case studies.
18	Generation costs. Discounted cash flow valuation.
19	Distribution costs, Cost structure of the Electricity business. Capital cost analysis
20	Intro. Objectives and financial policies
21	Cost of Capital. Optimal financial structure
22	Financial needs and working capital management
23	Alternatives for financing. Risk analysis and risk management (1/2)
24	Risk analysis and risk management (2/2). Project financing and non-recourse debt
25	Analysis and valuation of electricity companies by financial markets

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

26	Introduction to strategy in the electric power industry
27	Value innovation. Business plan
28	Strategy in the electric power industry (1)
29	Strategy in the electric power industry (2)
30	Case presentations

SCHEDULE

SUMMARY OF WORKING HOURS OF THE STUDENT			
CLASSROOM HOURS			
Lectures	Oral presentations	Tutoring	
56	6	Up to 10	
NON-CLASSROOM HOURS			
Personal study	Personal work in case studies		
95	25		
ECTS CRÉDITS:			6 (180 hours)

BIBLIOGRAPHY

Basic bibliography
<ul style="list-style-type: none"> Presentations provided by the instructors
Complementary bibliography
<p>Microeconomics</p> <ul style="list-style-type: none"> 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" <p>Financial Analysis</p> <ul style="list-style-type: none"> 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 <p>Strategy</p> <ul style="list-style-type: none"> 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. Palepu Paper, "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)

Week	h/w	Class	Content	In-class activities		Out of class activities			Learning outcomes		
				Lecture and problem solving	Assessment	h/w	Self-study	Problem solving	Individual and in-group assignments	Learning outcomes	Description
1	4	1	Introduction to the course - Introduction to Microeconomics			4	Review and self-study			LO1	Introduction to the course. Introduction to economics and to some general principles of microeconomics.
		2	Microeconomic analysis of the electric power industry - Demand and supply (i)							LO1	Understand supply and demand diagrams. Introduce demand and supply elasticity. Consumer and producer surplus.
2	4	3	Microeconomic analysis of the electric power industry - Demand and supply (ii)			4	Review and self-study			LO1	Understand supply and demand diagrams. Introduce demand and supply elasticity. Consumer and producer surplus.
		4	Microeconomics - Economics in the centralized context (i)							LO1	The all-knowing, all-powerful perfect benevolent planner. The concept of net social welfare.
3	4	5	Microeconomics - Economics in the centralized context (ii)	Problem solving		4	Review and self-study	Problem solving		LO1	The all-knowing, all-powerful perfect benevolent planner. The concept of net social welfare.
		6	Microeconomics - Perfect competitive markets (i)		Exam Microeconomics					LO2	Characterization of a perfect competitive market. Analysis of supply, demand and equilibrium in the electricity markets.
4	4	7	Microeconomics - Perfect competitive markets (ii)	Problem solving		4	Review and self-study	Problem solving		LO2, LO3	Characterization of a perfect competitive market. Analysis of supply, demand and equilibrium in the electricity markets.
		8	Microeconomics - Monopoly and oligopoly (i)	Problem solving						LO3	Imperfect competition and monopolies. Oligopolistic models and market agents' behavior in oligopolistic markets. Market power indexes.
5	4	9	Microeconomic analysis - Monopoly and oligopoly (ii) and test		Exam Microeconomics	4	Review and self-study			LO3	Final exam (Microeconomics)
		10	Financial statements. Structure of balance sheet and income statement.							LO4	Introductory session to the Financial Statements: information contained, different types, basic principles used to prepare them, objectives and main users. Preliminary analysis of the structure and basic concepts of the Balance Sheet and the Income Statement.
6	4	11	Balance sheet analysis: assets, equity and liabilities			4	Review and self-study			LO4	The different lines of the Balance Sheet. Practical approach, analysing Endesa's Financial Statements.
		12	Income statement analysis: revenues & expenses							LO4	Analysis of the Income Statement. Study of the different margins shown in an Income Statement: contribution margin, EBITDA, EBIT, EBT and Net Result.
7	4	13	Cash flow statement analysis			4	Review and self-study	Problem solving		LO4	Basic concepts and methods to prepare a Cash Flow Statement. Review of the different kinds of Cash Flows. Free Cash Flow and Net Cash Flow. Analysis of Endesa's Cash Flow.
		14	Case study (1)	Problem solving	Case study					LO4, LO5	Comprehensive exercise to elaborate and interpret a set of Financial Statements: Balance Sheet, Income Statement and Cash Flow. To be prepared and presented in class in groups.

WORK PLAN (ii/ii)

Week	h/w	Class	Content	In-class activities		Out of class activities			Learning outcomes		
				Lecture and problem solving	Assessment	h/w	Self-study	Problem solving	Individual and in-group assignments	Learning outcomes	Description
8	4	15	Case study (2) and test	Problem solving	Case and Exam	4	Review and self-study		Case study	LO4, LO5	Final exam
		16	Economic and Financial analysis. Ratios							LO4, LO5	The Electricity Business: Departing from UNESA's income account, a description of the main cost items of the electricity business is made, both operating and capital costs
9	4	17	Economic and Financial returns. Case studies.			4	Review and self-study			LO4, LO5	Ratios: The use of financial ratios by financial analysts is explained. The notions of financial leverage and value creation are introduced.
		18	Generation costs. Discounted cash flow valuation.							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.
10	4	19	Distribution costs, Cost structure of the Elec. business. Capital cost analysis		Exam	4	Review and self-study			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 analysts is explained.
		20	Intro. Objectives and financial policies							LO4, LO5	The objective of the firm, the positioning of the financial function within the company and strategic decisions of financial management (investment, financial structure, dividend, financial communication).
11	4	21	Cost of Capital. Optimal financial structure			4	Review and self-study			LO4, LO5	The cost of the financial resources used by the company (WACC). Optimal financial structure. Rating Agencies and the rating process.
		22	Financial needs and working capital management							LO4, LO5	Financial Planning Process (short and long term). Working Capital management. Banking instruments for short term financial management.
12	4	23	Alternatives for financing. Risk analysis and risk management			4	Review and self-study			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.
		24	Risk analysis and risk management. Project financing and non-recourse debt							LO4, LO5	The concept of Project Finance. Pros and cons vs. corporate financing. Requirements of an investment to structure a Project Finance. The economic model and the risk identification and mitigation process.
13	4	25	Analysis and valuation of electricity companies by financial markets		Exam	4	Review and self-study			LO4, LO5	Analysis and valuation of electricity companies by financial markets: Quantitative and Qualitative analysis. Different methods used to value a company/project. Valuation using dynamic models (cash flow discount)
		26	Introduction to strategy in the electric power industry							LO6	Key concepts of Business Unit Strategy. Readings & Discussion: What is strategy?
14	4	27	Value innovation. Business plan			4	Review and self-study		Case study	LO6	Strategy and Financial statements Review of financial statement analysis – relationship with strategy.
		28	Strategy in the electric power industry (1)							LO6	Business Plans. Readings & Discussions: How to write a great business plan
15	4	29	Strategy in the electric power industry (2)			4	Review and self-study		Case study	LO6	Mergers & Acquisitions Readings & Discussion: Making Acquisitions, Valuation Methods
		30	Case presentations		Case presentations					LO6	Case presentation