UNIVERSIDAD PONTIFICIA ICAI ICADE COMILLAS MADRID
ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA

SYLLABUS
YEAR 2016-2017

Course information	
Name	Investing and Financing in Technology and Industry
Code	DOI-MBA-612
Degree	Máster en Ingeniería Industrial (MII), Máster en Ingeniería de Telecomunicación (MIT), Máster in Business Administration (MBA)
Year	2nd
Semester	1st (Fall)
ECTS credits	3 ECTS
Type	Basic
Department	Organización Industrial
Area	Economics and Business Administration
Coordinator	Pedro Sánchez Martín

Instructor	
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COURSE SPECIFICS

Context of the course

Contribution to the professional profile

This course introduces the basic concepts of large scale, capital intensive projects valuation and finance, bringing together skills and techniques previously learnt in the degree.
The infrastructure industry is one of the most relevant for engineers and several industrial and financial players demand finance engineering capabilities: sponsors, finance providers, infrastructure funds, EPC-contractors and others.
Upon course completion, students will have a real-world working knowledge of project finance, which will enable them to effectively put the concepts and frameworks into practice in real life projects.
More specifically, the contributions of this course to the professional profile are the following:

- Understand the different sources of finance available in the market for large scale, capital intensive projects and their cost and main features
- Understand project finance structure as a value-creation tool for this type of projects, as well as the modelling techniques for this type of financing.
- Overview of the infrastructure industry from several angles: sponsor, financing provider, infrastructure funds, asset management and others
- Be able to compare not only one project with another, but all business proposals with our cost of capital and, therefore, assess and measure whether they are value-added or value-destroyed projects.

Pre-requisites

Previous knowledge of corporate finance (cost or capital and project valuation) is required, although they will be reviewed and revisited during the course.

Competences and Learning Outcomes

Competences

General Competences

CG01 Acquire appropriate capabilities of analysis and their application to specific business situations

CG02. Manage data and information as a key element in the decision making process, as well in problem solving

CG03. Be able to solve problems and take decisions at a strategic, tactic and operational level within a company, taking into account the interrelation among different functional and business areas

Specific Competences

CE09. Acquire the quantitative, analysis and modelling capabilities necessary to solve company problems, and be able to apply them to business forecast and specific situations simulation

Learning Outcomes

RA01. Determine the relevant Project Cash Flow, quantifying the project´s ability to produce and consume cash on a yearly basis

RA02. Evaluate the economic attractiveness of a Project for a Company, choosing and calculating the appropriate criteria

RA03. Identify and evaluate the different sources of fund for a large scale project
RA04. Understand different financing structures, in qualitative and quantitative terms
RA05. Understand the rationale and basic terms of Project Finance
RA06. Understand the modelling of a Project Finance, identifying and quantifying the different parts of the cash flow waterfall
RA07. Understand the infrastructure industry, including main players and financing and valuation criteria and methodologies

CONTENTS AND MODULES

Contents	
1 INTRODUCTION	
1.1	Evaluation and funding of Projects
1.2	Evaluating a Project
1.3	Financing of a Capital Project
2 COST OF CAPITAL	
2.1	Introduction
2.2	Cost of Equity
2.3	Cost of Debt
2.4	WACC
3 FINANCING OF CAPITAL PROJECTS	
3.1	Overview of Capital Projects
3.2	Sources of Finance
3.3	Dividend Policy
3.2	Financial Securities
3.1	Comparison of Equity and Debt Financing
4 PROJECT FINANCE	
4.1	The rationale for Project Finance: project financing versus direct financing
4.2	Analysis of Project Feasibility
4.3	Financing modelling
4.3	Financing Plan and Capital Structure
4.4	Debt sizing and structure
4.5	Cash flow waterfall
5 PROJECT EVALUATION	
5.1	Creating value for the investor
5.2	Criteria overview
5.2	Discounted Cash flow techniques
6 CAPITAL / INFRAESTRUCTURE PROJETS MARKETS	
6.1	Infra-asset business models
6.2	Valuation of infrastructure projects
7 START-UP FINANCING	
7.1	Overview
7.2	Main concepts and sources of finance

TEACHING METHODOLOGY

General methodological aspects
In order to achieve the learning objectives stated above, the course will focus on the students' activity and on their active learning. Therefore, the methodology will be oriented towards a more active role of the student.
In-class activities
• **Lectures:** the instructor will introduce the fundamental concepts of each session, including some recommendations and examples to illustrate the concepts. This will help students to identify the basic elements and to face related problems. • **Practice exercises:** under the instructor's supervision, students –individually or divided into small groups-, will apply the concepts and techniques covered in the lectures to short application exercises to be solved in class. • **Problem solving/Case discussion:** In these sessions, tasks previously given to students (problems and case studies) will be discussed and solved. In order to participate in these sessions the student must previously work and prepare his own intake of the problem/case. • Active participation will be encouraged by rising open questions to foster discussion.
Out-of-class activities
The objective of non-classroom activities is to work through the concepts and methodologies described in class, and to apply them to the different problems or case studies presented in the classroom or given by the instructor. • Personal study of the course material and resolution of the proposed exercises • Case preparation to make the most of in-class time

ASSESSMENT AND GRADING CRITERIA

Assessment activities	Grading criteria	Weight
Mid-term test	▪ Understanding of the theoretical concepts. ▪ Application of these concepts to problem and case solving. ▪ Critical analysis of numerical exercises' results.	20%
Final exam	▪ Understanding of the theoretical concepts. ▪ Application of these concepts to problem and case solving. ▪ Critical analysis of numerical exercises' results.	50%
Class participation and Case Resolution	▪ Class participation. ▪ Case intake (Pre and post discussion in class).	30%

COURSE RULES

Course rules
▪ Class attendance is mandatory according to Article 93 of the General Regulations (Reglamento General) of Comillas Pontifical University and Article 6 of the Academic Rules (Normas Academicas) of the ICAI School of Engineering. Not complying with this requirement may have the following consequences: - Students who fail to attend more than 15% of the lectures may be denied the right to take the final exam during the regular assessment period. Students who commit an irregularity in any graded activity will receive a mark of zero in the activity and disciplinary procedure will follow (cf. Article 168 of the General Regulations (Reglamento General) of Comillas Pontifical University).

WORK PLAN AND SCHEDULE[1]

In and out-of-class activities	Date/Periodicity
Mid-term test	Week 10
Final exam	December
Case sessions	Week 9
Review and self-study of the concepts covered in the lectures	After each chapter
Problem-solving	After each chapter which requires problem solving
Practice preparation (Test)	Before every practice
Final exam preparation	December

STUDENT WORK-TIME SUMMARY			
IN-CLASS HOURS			
Lectures	**Problem-solving**	**Case sessions**	**Test & exam**
18	7	2	3
OUT-OF-CLASS HOURS			
Self-study	**Problem preparation and solving**	**Case preparation and evaluation**	**Practice**
40	14	6	
		ECTS credits:	**3 (90 hours)**

[1] A detailed work plan of the subject can be found in the course summary sheet. Nevertheless, this schedule is tentative and may vary to accommodate the rhythm of the class.

BIBLIOGRAPHY

Basic bibliography

- Notes and slides prepared by lecturer

Complementary bibliography

- Crundwell, F.K. (2008). Finance for Engineers. Evaluation and Funding of Capital Projects. Springer.
- Brealey, R., Myers, S. and Marcus, A. (2012) Fundamentals of Corporate Finance, 7th Edition. McGrawHill.
- Higgins, R.C. (2011) Analysis for Financial Management, 10th Edition. McGrawHill.
- Ross, S. Westerfield, R. and Jordan, B. (2014) Essentials of Corporate Finance, 8th Edition. McGrawHill.
- Bodmer, E. (2014) Corporate and Project Finance Modeling: Theory and Practice. Wiley Finance

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INVESTING AND FINANCING IN TECHNOLOGY AND INDUSTRY (2015-16)

	IN-CLASS ACTIVITIES				OUT-OF-CLASS ACTIVITIES	
Week	**MF**	**Session**	**Contents**	**Activity**	**Self-study**	**Cases and Project**
1	03-sep	1	Presentation+ Overview	Initial test + Lecture	Review, self-study and problem-solving	
	03-sep	2	Company lyfe cycle	Lecture		
2	10-sep	3	Sources of funds	Lecture	Review, self-study and problem-solving	
	10-sep	4	Dividend policy	Lecture		
3	17-sep	5	Cost of equity and debt	Lecture	Review, self-study and problem-solving	
	17-sep	6	Cost of equity and debt	Short exercises		
4	24-sep	7	WACC	Lecture	Review, self-study and problem-solving	
	24-sep	8	WACC	Short exercises		
5	01-oct	9	Finance engineering projects	Lecture	Review, self-study and problem-solving	
	01-oct	10	Rationale / value creation of project finance	Lecture		
6	08-oct	11	Project cash flows analysis	Lecture	Review, self-study and problem-solving	
	08-oct	12	Project cash flows analysis	Short exercises		
7	15-oct	13	Project finance capital structure	Lecture	Review, self-study and problem-solving	
	15-oct	14	Project finance debt modelling	Short exercises		
8	22-oct	15	Cash flow waterfall	Lecture	Review, self-study and problem-solving	Project finance case asessment and preparation
	22-oct	16	Cash flow waterfall	Short exercises		
9	29-oct	17	Project finance case	Case solving	Review, self-study and problem-solving	
	29-oct	18	Project finance case	Case solving		
10	05-nov	19	Mid term test	Test	Review, self-study and problem-solving	
	05-nov	20	Project valuation: relevant cash flows	Lecture		
11	12-nov	21	Project valuation	Lecture	Review, self-study and problem-solving	Project valuation exercise preparation
	12-nov	22	Project valuation	Short exercises		
12	19-nov	23	Project valuation exercise	Exercise solving	Review, self-study and problem-solving	
	19-nov	24	Infra-assets market	Lecture + short exercises		
13	26-nov	25	Valuation of infra projects	Lecture + short exercises	Review, self-study and problem-solving	
	26-nov	26	Valuation of infra projects	Lecture + short exercises		
14	03-dic	27	Technology / internet financing / start ups	Lecture	Review and self-study	
	03-dic	28	Technology / internet financing / start ups	Lecture		
15	10-dic	29	Review	Lecture + short exercises	Review, self-study and problem-solving	
	10-dic	30	Review	Lecture + short exercises		
16	17-dic	31	Exam			
	17-dic	32				