Syllabus
Game Theory and Market Strategies

August – December 2018

Professor:
Juan José Cieza

I.   General Information

Course: Game Theory and Market Strategies   Code: 12677
Requisite: *Microeconomía II*   Term: 2018 - 2
Credits: 3   Type: Elective
Start date: August 24th
Finish date: December 6th
Hours a week: 3

II. Summary

This course explores the relationship among the participants in the market place under the scope of Game Theory tools set. In this framework, strategic reasoning will become a way of assessment to understand: i) why firms decide to produce a specific kind of product, ii) how this is priced, iii) if such product is needed to be differentiated from its competitors, iv) what would be the capacity of the plant that is set, v) what would be the quality and information level offered to the consumers, vi) how much research and development must be invested and so on.

All these questions and others more will be addressed considering the impact that firms exert on their competitors when they apply determined actions and how the others could anticipate the effects of such actions. In this sense, the endogenous interaction will constitute the relevant element in such relationship whereby, depending on the specific kind of "battle field" that will be consider in this matter: dynamic actions, repeated struggles, private information, among others, equilibrium is achieved.

III. Course Objectives

The course's aim is to develop in the students the abilities to allow them to execute own strategies and to assess others'. Business context is the main subject to study, whereby the more relevant aspects such as type product, competitors, pricing, research and development, among other will be tackled under Game Theory perspective.

IV. Learning Outcomes

At the end of the course, the students will be able to:

-   Assess and design strategies under Game Theory perspective.
-   Applying Game Theory modeling
-   Analyze the interaction of competitors in an imperfect market and its consequences in the short and long run.
-   Incorporate uncertainty and asymmetric information in the market analysis.

V. Methodology

The course will be developed by theoretical classes, using some basic tools of mathematics (calculus) and statistics. We also will solve examples and exercises that will be useful for examinations. Students are strongly recommended to read the material provided by the professor in advance, in order to discuss the topics in class (see VI. Grading)

In addition, students will provide each class short expositions about an article read in advance (research made by the own students) regarding the correspondent topic (from week 5 onwards). Student groups will do a presentation of a Strategy Report that will take place at the end of the term with the purpose to fully apply the theoretical framework developed along the course.

VI. Grading

The grading system is permanent along the term. The final grade will consider a reading, a group presentation and student participation in class – Permanent Evaluation (50%), a midterm exam (25%) and a final exam (25%)

There will be one main control reading (Ariely Dan. Predictably Irrational: The Hidden Forces that Shape our Decisions. Harper Collins, 2010[1]) that will take place immediately after the midterm exam (1 hour). The Strategy Report presentation will consist on an industry analysis using the game theoretical framework. The evaluation of the latter will consider Game Theory rules in the expositions.

The Permanent Evaluation (PE) is a result of the following:

PERMANENT EVALUATION 50%		
Evaluation Type	**Description**	**weight %**
Strategy Report presentation	Students will gather in groups to tailor a Strategy Report for a class presentation.	25%
Class participation: Article exposition	This will start since topic 5 (week 5). Each student will be endowed with 7 points at the beginning but will lose them in 1 point each class, unless he/she presents and discuss his/her own article. Spontaneous participation is rewarded with 1 extra point (max. 3 along the term), otherwise randomly call will apply.	10%
Main Control Reading	Predictably Irrational	15%

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[1] It could be an alternative book, if required.

The final grade is the result of applying the following formula:

$$\mathbf{FG} = (0{,}25 \times MT) + (0{,}50 \times PE) + (0{,}25 \times FE)$$

FG = Final Grade
MT = Midterm Exam
PE = Permanent Evaluation
FE = Final Exam

VII. Scheduled Contents

WEEK	CONTENTS	ACTIVITIES /ASSESSMENTS
LEARNING UNIT I: GAME THEORY, GAME TYPES AND APPLICATIONS **LEARNING OUTCOMES:** Students will learn to think strategically and to apply game theory reasoning in business contexts as well as in daily life.		
1° August 21 - 26	**1.1 Thinking Strategically**: Intro and examples **1.2 Static Games of Complete Information** (beyond prisoners' dilemma): Best response function and equilibrium. **1.3 Mixed Strategies** **1.4 Cournot Model**	
	Readings: - Dixit, Avinash. (and others). Games of Strategy. W. W. Norton & Company, Inc, 2015. Chapter 1, 2, 4, 5 and 7. - Gibbons, Robert. Game Theory for Applied Economists. Princeton University Press, 1992. Chapter 1	
2° *August 28-September 02*	**2.1 Extensions of Cournot Models**: - Free Entry and Cournot Equilibrium - The efficient number of competitors **2.2 Bertrand Model** - Product Differentiation - Capacity Constraints **2.3 Cournot vs Bertrand**	
	- Church, Jeffrey and Ware, Roger. Industrial Organization: A Strategic Approach. Mc Graw Hill, 2000. Chapter 8	
3° *September 03 – 08*	**3.1. Dynamic Games of Complete Information** - Representation, Backward induction and Equilibrium - Applications: i) Stackelberg Model, ii) Two stage games: Bank Runs and Tariff and Imperfect International Competition	
	Readings: - Gibbons Robert. Game Theory for Applied Economists. Princeton University Press, 1992. Chapter 2. - Dixit, Avinash. (and others). Games of Strategy. W. W. Norton & Company, Inc, 2015. Chapter 3 and 6.	

4° *September* 10 – 15	**4.1 Static Games of Incomplete Information** - Bayesian Nash Equilibrium - Applications: Auctions and Cournot Imperfect Competition Model with higher and lower costs	
	Readings: - Gibbons Robert. Game Theory for Applied Economists. Princeton University Press, 1992. Chapter 3.	
LEARNING UNIT II: MARKET STRATEGIES IN THE BUSINESS CONTEXT *LEARNING OUTCOMES:* Students will learn all the tools that firms can use in the business context.		
5° *September* 17 – 22	**5.1 Product Differentiation** - Monopolistic Competition - Horizontal and Vertical differentiation - Models: Hotteling and Salop - Strategic Behaviour: Brand proliferation and specification.	**Article exposition by student**
	Readings: - Church, Jeffrey and Ware, Roger. Industrial Organization: A Strategic Approach. Mc Graw Hill, 2000. Chapter 8 - Belleflamme, Paul and Peitz, Martin. Industrial Organization: Markets and Strategies. Cambridge University Press, 2015.	
6° *September* 24 – 29	**6.1 Entry and Exit** - The role of investment - Contestable Markets - Entry Barries	**Article exposition by student**
	- Church, Jeffrey and Ware, Roger. Industrial Organization: A Strategic Approach. Mc Graw Hill, 2000. Chapter 14 - Tirole, Jean. The Theory of Industrial Organization. The MIT Press. 1988. Chapter 8.	
7° October 01 – 06	**7.1. Mid term exam**	
8° October 08 – 13	**MID TERM EXAMS**	
9° October 15 – 20	**9.1 Pricing** - Group pricing and personalized pricing - Menu pricing - Intertemporal price discrimination - Bundling	**Article exposition by student**
	Readings: - Belleflamme, Paul and Peitz, Martin. Industrial Organization: Markets and Strategies. Cambridge University Press, 2015. Chapter 8, 9, 10 and 11	
10° October 22 - 27	**10.1 Product quality and advertising** - Advertising and related market strategies - Asymmetric information, price and advertising signals - Marketing tools for experience goods: warranties and branding.	**Article exposition by student**

	Readings: - Belleflamme, Paul and Peitz, Martin. Industrial Organization: Markets and Strategies. Cambridge University Press, 2015. Chapter 6, 12 and 13. - Tirole, Jean. The Theory of Industrial Organization. The MIT Press. 1988. Chapter 2	

11°
 	
October 29 - November 03
	11.1 Research and Development and Intellectual Property
	    Incentives to innovate
	    When innovation affects market structure
	    Cooperation and Spillovers
	    Protecting innovations
		Article exposition by student

	Readings: - Belleflamme, Paul and Peitz, Martin. Industrial Organization: Markets and Strategies. Cambridge University Press, 2015. Chapter 18 and 19 - Church, Jeffrey and Ware, Roger. Industrial Organization: A Strategic Approach. Mc Graw Hill, 2000. Chapter 18.	
12° November 05 – 10	**12.1 Network Economics** - Market with network goods - Strategies for network goods	**Article exposition by student**
	Readings: - Belleflamme, Paul and Peitz, Martin. Industrial Organization: Markets and Strategies. Cambridge University Press, 2015. Chapter 20 and 21	

13°
 	
November 12 – 17
	13.1 Auctions
	    The Vickrey auction.
	    Four basic auction mechanisms
	    Revenue equivalence.
	    Applications
		Article exposition by student

	Readings: - Campbell, Donald E. Incentives: motivation and the economics of information, Cambridge University Press, 2006.	
14° November 19 – 24		• **Strategy Report presentation**
15° November 26 - December 01	**15.1.Final exam** of elective courses	
16° December 03 – 08	**FINAL EXAMS**	

*Consider November 1 is a holiday in the 2017-2 semester

VIII. References

1. Ariely, Dan (2010). Predictably Irrational: The Hidden Forces that Shape our Decisions. Harper Collins.

2. Belleflamme, Paul and Peitz, Martin (2015). Industrial Organization: Markets and Strategies. Cambridge University Press.

3. Besanko, David; Dranove, David; Shanley, Mark and Schaffer, Scott (2017). Economics of Strategy, Willey Custom.

4. Campbell, Donald E. (2006). Incentives: motivation and the economics of information. Cambridge University Press.

5. Church Jeffrey and Ware Roger (2001), Industrial Organization: A Strategic Approach, McGraw Hill.

6. Dixit, Avinash; Skeath, Susan and Reiley, David (2015). Games of Strategy. W. W. Norton & Company, Inc.

7. Gibbons Robert (1992), Game Theory for Applied Economists, Princeton University Press.

8. Tirole, Jean (1988). The Theory of Industrial Organization. The MIT Press.

IX. Professor

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