Introduction to Game Theory

Course Code			
Class Times	TBA	**Classroom**	TBA
Equivalent Year Level	1	**Course Credit**	3

Instructor	Dmitry Shapiro	**Sessions**	1-14
Office	16-639	**Email**	dmitry.shapiro@snu.ac.kr

❑ Instructor's Profile

Dmitry Shapiro
General Information

Education
Ph.D. in Economics, Yale University, 2006
MA in Economics, New Economic School, 2001
B.S. in Mathematics, Moscow State University, 1999

Expertise
Microeconomic Theory, Game Theory, Behavioral Economics

Most Recent Works

- "Characteristics of mutual funds with extreme performance", *Review of Financial Economics* 34 (2017), pp. 50-60 (joint with Jason Berkowitz and Patrick Schorno)
- "Contribution Limits and Transparency in a Campaign Finance Experiment", *Southern Economic Journal,* 84.1 (2017), pp. 98-119 (joint with Artie Zillante)
- "An Experimental Study of Alternative Campaign Finance Systems: Transparency, Donations and Policy Choices*", Economic Inquiry,* 54.1 (2016), pp. 485-507 (joint with Hanming Fang and Artie Zillante)
- "Microfinance and Dynamic Incentives", *Journal of Development Economics,* 115 (2015), pp. 73 – 84
- "Dividends as Signaling Device and the Disappearing Dividend Puzzle", *Journal of Economics and*

Business, Vol. 79 (2015), pp. 62 - 81 (joint with Anan Zhuang)

- "Level-k reasoning in Generalized Beauty Contest Games." *Games and Economic Behavior,* 86 (2014), pp. 308-329 (joint with Xianwen Shi and Artie Zillante)

❑ Course Information

Course Description	This course is an introduction to game theory. Game theory is a way of thinking about strategic situations, which is when the outcome of one's choice depends not only on given parameters of the environment (prices, production function, demand curve), but also on choices of other agents. In this course we will develop introduce tools that will help us to approach and analyze strategic situations. We will apply these tools to many different settings including economics, political science, sociology and even evolutionary biology. The course will emphasize examples. We will also play several games in class. Having some background in micro-economics (introductory level would suffice) is highly recommended. We will use basic calculus in this course (mostly, one variable). We will also refer to ideas like probability and expectation.
Course Evaluation	Midterm exam 40% Final exam 60%
Course Materials	(W) Joel Watson *Strategy: an introduction to game theory*. 3rd edition. WW Norton, 2013. Earlier editions are also acceptable. (D) P. K. Dutta: *Strategies and Games: Theory and Practice*, MIT, 1999. It's an old book but can be very helpful. A number such as 2.1 will refer to chapter 2 section 1 of a corresponding book
Class Policy	**Attendance** will be important for keeping up with class. Good attendance and **active participation** will be reflected in grade.
Misc.	Given the fast pace of summer classes some of the class time will be devoted to solving problems. Problems solving will be open-book, plus I will be walking around providing some tips. Problems solving will affect the final grade but with a low weight. The purpose for this is to strengthen your understanding of the material via, well, solving problems. It will be a group exercise with three-four people per group. The midterm and the final will be closed-book and are to be done individually.

❑ Course Schedule

Normal Form Games

Session 1 (Jun. 26, Wed) – Introduction: Prisoners dilemma, coordination. Dominance and Iterative Deletion *(W: 1 and 6; D: 1.1-1.3, 2.3-2.4)*;

Session 2 (Jun. 27, Thu) – Applications of Dominance Argument. Best Response and Rationalizability *(W: 6 and 7; D: 2.3, 3-4, except 3.1.2);*

Session 3 (Jul. 1, Mon) – Introduction to Nash Equilibrium. Examples. Applications. *(W: 9 and 10; D: 5 and 7)*;

Session 4 (Jul. 3, Wed) – Nash Equilibrium continued. Applications: Oligopoly, Voting, Locations *(W: 9 and 10; D: 6 and 7);*

Session 5 (Jul. 4, Thu) – Mixed Strategies: Theory and Applications *(W: 11; D: 8 and 9)*;

Session 6 (Jul. 8, Mon) – Evolution and Game Theory (*Extra reading will be posted online*)

Session 7 (Jul. 10, Wed) – *Midterm Exam*

Extensive Form Games

Session 8 (Jul. 11, Thu) – Introduction to Sequential Games, Backward Induction; Commitment; First- and Second-mover advantage *(W: 2; D: 11)*;

Session 9 (Jul. 15, Mon) – Backward Induction continued; Zermelo theorem; Credibility; Reputation; Duels *(W: 21; D: 11 and 12);*

Session 10 (Jul. 17, Wed) – Ultimatums, Bargaining, Introduction to Imperfect Information; Information sets; Subgame Perfection; Strategies *(W: 15, 16 and 19; D: 13)*;

Session 11 (Jul. 18, Thu) – Subgame Perfect Equilibrium (SPE); Applications of SPE; Direct and Strategic Effects; Wars of Attrition *(W: 16; D: 13)*;

Session 12 (Jul. 22, Mon) – Repeated Games *(W: 22 and 23; D: 14-18, but be selective)*;

Incomplete Information

Session 13 (Jul. 24, Wed) – Incomplete Information; Bayesian Nash Equilibrium *(W: 26)*;

Session 14 (Jul. 25, Thu) – Applications: Auctions, Signaling *(W: 27 and 29)*;

Session 15 (Jul. 26, Fri) – *Final Exam*