University of Jordan	
Faculty of Business	
Department	**Business Economics**
Program	**Undergraduate**
Module title / number	**Introduction to Game Theory and its Applications in Economics 1607214**
Pre-requisite	**Microeconomics Theory(1607210).** **Introduction to Mathematical Economics (1607115)**
Module description	**The aim of the course is to provide students with an introduction to the modern game theory and its applications in economics.** **Game theory provides important tools for analyzing situations, where the correct decision for one agent depends upon the actions taken by the others and has been widely applied in economics, political science as well as law, biology and computer science. Primary attention is paid to game theoretic analysis leading to better understanding of the formation of stable states of equilibrium in the absence of markets, as well as better understanding of various forms of strategic interaction under imperfect competition (e.g., under oligopoly) or imperfect information (under conditions of risk and uncertainty).** **Theoretical topics to be covered range from pure to mixed strategies, from zero-sum games and the minimax theorem to variable-sum games and Nash equilibrium, and from rationlizable strategic moves to evolutionary stable (ESS) ones. Occasional applications to politics and international conflicts will also be discussed.**
Aims	**This module aims at giving students an understanding of the techniques and the concepts of game theory. Students will then use these techniques and concepts to study various questions in different fields of economics. After completing the course, students will be able to take the new insights gained beyond the particular questions they study to better understand interactions and interplay of incentives in more real-life situations.**
Intended learning outcomes (ILOs) **Upon the completion of this module , students should be able to achieve the following:**	
1- knowledge and understanding	
	students should understand: • **The techniques and the concepts of game**

	theory. • **Strategic interactions among people or organizations and how they should be advised to behave in order to maximize their own payoffs.** • **A wide range of problems from oligopoly pricing to the evolution of trust.**
2- analytical and thinking skills	
	Students should have the ability to: • **Think strategically and be able to learn how to recognize and model strategic situations.** • **Predict when and how their actions will influence the decisions of others and to exploit strategic situations for their own benefit.** • **Apply game-theoretic analysis, both formally and intuitively, to negotiation and bargaining situations.** • **Think analytically, analyze and solve a wide variety of games and applications.** • **Take the new insights gained beyond the particular questions they study to better understand interactions and interplay of incentives in more real-life situations.**
Teaching and learning methods	
	- There will be 3 hours per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively. **- Weekly take-home problem set will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.**
Assessment methods	
	Students will be assessed based on the following: **Mid-term Exam 30%** **Second Exam 10%** **Homework 10%** **Final Exam 50%** **Details of the assignment and the submission deadline will be announced in class. Dates of exams will be announced in the class.**
Academic Honesty	
	All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, lifting or helping other students in such actions will be dealt

	with strictly according to the university regulations.		
Main textbook(s) and additional readings			
	***Games of Strategy*, 2nd edition, Avinash Dixit & Susan Skeath, Norton, 2004.** ***Fun and Games: A Text on Game Theory*, Ken Binmore, Heath and Company, 1992.**		
Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1	**Introduction and preliminary concepts.**	**TBA**
	Week 2+3	**Pure strategy equilibrium in sequential-move games** **(1) Sequential-move games.** **(2) Backward induction.** **(3) Extensive and strategic forms.** **(4) Simultaneous-move games.**	**TBA**
	Week 4	**Pure strategy equilibrium in simultaneous-move games** • **Nash equilibrium.** • **Dominance solvability.**	**TBA**
	Week 5	**Mixed strategy equilibrium**	**TBA**
	Week 6+7	**Rfinements** • **Subgame perfection.** • **Maximin (security) strategies.**	**TBA**
	Week 8	**Zero-sum games** **(1) Strictly competitive games.** **(2) Saddle point solutions,** **(3) The minimax theorem**	**TBA**
	Week 9+10	**Oligopolistic competition** **(1) Cournot's model of oligopoly.** **(2) Bertrand's model of oligopoly.** **(3) Stackelberg's model of duopoly.**	**TBA**
	Week 11	**Repeated Games** **(1) Stage games of multiple rounds.**	**TBA**

		(2) Nash equilibrium in repeated play. **(3) Repeated Prisoners' Dilemma and the Folk theorem.**	
	Week 12	**Evolutionary game theory**	**TBA**
	Week 13+14	**Further applications (as time permits)**	**TBA**
	Week 15	**Final exam**	**TBA**