Course Outline Form
Department of Economics and Social Sciences (ESS)
Brac University

ECO491 Introduction to Game Theory Summer 22

A. Course General Information:

Course Code :	ECO491
Course Title :	INTRODUCTION TO GAME THEORY
Credit Hours :	3
Contact Hours/Week :	3, Thursday/Saturday, 3:30 – 4:50, UB30101
Category	Economics Elective
Type:	Optional, Theory
Prerequisites :	ECO208 Intermediate Microeconomics II
Co-requisites:	None

B. Course Catalog Description (Content):

Game Theory uses mathematical models to study and analyse strategic interactions between agents. This course is designed to provide an understanding of the fundamental concepts in game theory as applied to economics in general and microeconomics in particular.

C. Rationale of the Course:

Game Theory is an essential part of an economist's toolkit. It is currently the best way to analyse situations where economic agents interact with each other in a strategic fashion and has wide applications. It is a more powerful tool than static optimisation and has supplanted it in most cases.

D. Course Objective:

The objective of the course is to provide students with an introduction to the subject matter of game theory, techniques of solving game-theoretic problems and examples of a range of economic applications.

E. Course Outcomes (COs):

Upon successful completion of this course, students will be able to

SL.	CO Description
CO1	Learn about basic equilibrium concepts such as Nash equilibrium and subgame perfect equilibrium.
CO2	Be able to solve for the equilibrium outcomes of simple games including the use of backward induction.
CO3	Be able to write down the extensive form or normal form representations for simple games.
CO4	Be able to use knowledge of game theory in a wide variety of economic applications.
CO5	Be able to understand and write clearly on the applications or extensions discussed during the course.

F. Mapping of Course Outcomes (COs) with Program Outcomes (POs):

COs	PO1 (Demonstrate Knowledge)	PO2 (Analyse)	PO3 (Assess)	PO4 (Communicate)
CO1	X			
CO2		X	X	
CO3	X	X	X	
CO4	X	X	X	
CO5	X	X		X

G. Course plan specifying content, COs, co-curricular activities (if any), teaching learning and assessment strategy mapped with COs:

Class Week	Topic	Teaching-Learning Strategy	Assessment Strategy	Corresponding COs
1	Basics of Game Theory: Players, Actions, Payoffs	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1
2	Representation of games in normal and extensive form, Concept of Nash equilibrium	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO3
3	Games of perfect and imperfect information	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO3
4	Finding pure strategy Nash equilibria	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
5	Finding mixed strategy Nash equilibria	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
6	Applications: Cournot and Bertrand models of Duopoly	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO5
7	Applications: Problem of the commons	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO5
8	Midterm		Exam	
9	Backward induction and subgame perfect equilibrium	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
10	Applications: Stackelberg Duopoly, Bargaining	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
11	Applications: Strategic Trade Policy	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO5
12	Static Bayesian Games, Bayesian Nash Equilibrium	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
13	Signalling Games	Lecture, Class participation	Problem Sets, Quizzes, Exams	CO1 to CO4
14	Comprehensive Review			

H. Learning Materials:

Recommended Readings: Graham Romp, "Game Theory: Introduction and Applications, Oxford University Press, 1997

Supplementary Readings: Robert Gibbons, "A Primer in Game Theory", Harvester Wheatsheaf, 1992. Martin Osbourne, "An Introduction to Game Theory", Oxford University Press 2004. Bierman and Fernandez, "Game Theory with Economic Applications", Addison-Wesley, 1998.

I. Assessment and Evaluation:

Assessment Strategy:

Quiz: A quiz is the short, common and a more casual form of assessment. Quizzes cover a limited amount of material, such as one or two topics. Quizzes help students stay engaged and prepare for tests, as well as allowing teachers to assess how well students understand the topic.

Problem Sets/Assignments: Problem Sets and Assignments support learners in grasping technical understanding of a concept, they also aid in widening their cognitive capabilities and horizons. Through assignments, students are introduced to a wealth of useful information and concepts. Assignments are a good approach for students to develop time management and organizing skills while improving their writing skills.

Examination: Examinations are more formal in nature and can determine whether a student passes or fails a course. Exams typically cover the entire course material (for midterm exam half of the course material). The format and length of an exam is generally longer and more comprehensive, which aids in evaluating a student's overall performance.

Key Dates: Midterm, Saturday 23/07/22. Final, Sunday 04/09/22

Marks distribution:

Attendance	5%
Assignment (Average of 2)	10%
Quizzes (Best 3 out of 4)	15%
Midterm Examination	20%
Final Examination	50%
Total:	**100%**

Make-up Procedures: To be decided in consultation with the instructor.

J. Grading policy:

Marks	Grades
97-100	A*
90-<97	A (4.0)
85- <90	A- (3.7)
80- <85	B+ (3.3)
75- <80	B (3.0)
70- <75	B- (2.7)
65- <70	C+ (2.3)
60- <65	C (2.0)
57- <60	C- (1.7)
55- <57	D+ (1.3)
52- <55	D (1.0)
50- <52	D- (0.7)
<50	F (0.0)
P	Pass
I	Incomplete
W	Withdrawal
R	Retaken

K. Course Coordinator: Wasiqur Rahman Khan, Professor. The course coordinator reserves the right to make adjustments to any part of the outline if circumstances dictate or for other sound pedagogical reasons. Students will be notified in advance if such changes are made.