B.A. (VS) Insurance Management
Semester V
DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE- 5.5)

Applied Game Theory

Course Title & Code	Total Credits	Lectures	Tutorial	Practical	Eligibility criteria	Pre-requisite of the course
Applied Game Theory **DSE – 5.5**	4	3	1	-	**Pass in class 12th**	-

Learning Objectives: This course covers an introductory level of game theory to provide analytical tools for business applications. Companies, managers and individuals often make decisions that affect the wellbeing of others. In turn, our compensation or payoffs are affected by the choices made by others. In simpler terms people often operate in situations of strategic interaction. This course aims to develop a game theoretic framework for understanding strategies in business. The content of the course covers the basic solution concepts of game theoretical analysis and illustrates the use of these concepts.

Learning Outcomes: After completion of the course, learners will be able to:

1. recognise the strategic issues in a problem and demonstrate basic understanding of how a game theorist might decide on the appropriate tools to analyse it.
2. appreciate the application of game theory in business and other real-life situations;
3. demonstrate an understanding of the underlying structure of games used in economics and apply game-theoretic analysis, both formally and intuitively, to various interactions in business environment.
4. use the theoretical knowledge for better decision making and develop insights on strategic interactions and fairness in allocation problems.

Unit 1: **10 Hours**

Introduction and Motivation, basic ideas and examples, thinking strategically, the nature of Strategic Interaction among players and the concept of Nash equilibrium

Unit 2: **10 Hours**

Games with Sequential moves with perfect and imperfect information, Nash equilibrium as a system of beliefs, dominant and dominated strategies.

Unit 3: **10 Hours**

Games with Simultaneous Moves: pure and continuous strategies, and combining sequential and simultaneous moves; Simultaneous Move games- mixed strategies.

Unit 4: **15 Hours**

Prisoners' Dilemma and Repeated games, Commitment and Strategic Moves, collective-action games and Evolutionary games.

Practical Exercises:

The learners are required to:

1. Watch a movie in the class called '*A beautiful Mind'* based on the life of John Nash to understand basic concepts of Game Theory. (Unit 1)

2. Play well designed games in class and watching others play them to understand concepts of strategy, backward induction and Nash equilibrium. Solve exercises given in class and identify Nash equilibrium. Play prisoners dilemma in teams of two in the class and analyse its outcome. (Unit 1)

3. Solve exercises where there are two players moving sequentially by drawing a game tree where each player has different number of actions. Play well designed sequential games in teams in class and analyse their outcome. (Unit 2)

4. Play simultaneous move game in class called "generalised beauty contest" with different groups of students. Rules of the game are explained in advance publicly. Game is followed by the discussion on the outcome. Make a list of pure strategies given in various exercises given in the class and identify dominant and dominated strategies. (Unit 3)

5. Role-playing exercises where the class is split into teams that play different roles in acting out a strategic situation. (Unit 4)

Suggested Readings:

- Dixit. A. K., Skeath. S., & Reiley. D. (2020). *Game of Strategy* (5th ed.). New York-London: W. W. Norton and Company Inc.
- Dixit. A. K., & Nalebuff. B. J., (2010). *The Art of Strategy: A Game Theorist's Guide to Success in Business and Life*, New York-London: W. W. Norton and Company.
- Watson. J. (2013). *Strategy: An Introduction to Game Theory* (3rd ed*)*. New York-London: W.W Norton & Company.

Notes:

1. Suggested readings shall be updated and uploaded on the college website from time to time.
2. Examination scheme and mode shall be prescribed by the Examination branch, University of Delhi from time to time.