Course Objective: 1)To provide students with a solid foundation in the principles and concepts of game theory.
2)To equip students with the ability to model and analyze strategic interactions in various fields using game theory.
3)To introduce students to different types of games, including strategic form, extensive form, and cooperative games, and their applications.
4)To explore advanced topics in game theory, including evolutionary game theory, mechanism design, and network games.
5)To develop critical thinking skills that enable students to apply game theory to real-world problems in economics, computer science, and engineering.

S. NO	Course Outcomes (CO)
CO1	Understand and apply the fundamental concepts and tools of game theory in strategic decision-making.
CO2	Model and analyze various types of games, including strategic form, extensive form, and cooperative games.
CO3	Compute and interpret Nash equilibria, subgame perfect equilibria, and other solution concepts in game theory.
CO4	Apply game theory to real-world scenarios, including economic competition, bargaining, auctions, and network design.
CO5	Explore and engage with advanced topics in game theory, preparing for further research or application in related fields.

S. NO	Contents	Contact Hours
UNIT 1	**Introduction to Game Theory** Overview of Game Theory: Definitions and Scope Types of Games: Cooperative vs. Non-Cooperative, Symmetric vs. Asymmetric, Zero-Sum vs. Non-Zero-Sum Basic Concepts: Players, Strategies, Payoffs, and Equilibrium The Concept of Nash Equilibrium: Definition, Examples, and Applications Dominant and Dominated Strategies, Best Response Functions	**8**
UNIT 2	**Strategic Form Games and Mixed Strategy Equilibria** Strategic Form Representation of Games Pure Strategy Nash Equilibrium: Existence and Computation Mixed Strategy Nash Equilibrium: Concept, Computation, and Examples Applications of Mixed Strategy Equilibria in Real-World Scenarios Introduction to Bayesian Games: Incomplete Information and Bayesian Equilibrium	**8**

UNIT 3	**Extensive Form Games and Repeated Games** Extensive Form Representation of Games: Game Trees, Information Sets, and Strategies Subgame Perfect Equilibrium: Concept, Computation, and Examples Introduction to Repeated Games: Finite and Infinite Horizon The Folk Theorem and its Implications for Cooperation in Repeated Games Case Studies: Applications of Repeated Games in Economics and Computer	**9**
UNIT 4	**Cooperative Game Theory** Introduction to Cooperative Games: Coalition Formation and Payoff Distribution The Core: Definition, Properties, and Computation The Shapley Value: Concept, Calculation, and Applications Bargaining Games: Nash Bargaining Solution and Applications Applications of Cooperative Game Theory in Economics, Politics, and Network Design	**9**
UNIT 5	**Advanced Topics in Game Theory** Evolutionary Game Theory: Concepts, Replicator Dynamics, and Evolutionarily Stable Strategies Mechanism Design: Incentives, Implementation, and Revelation Principle Auctions and Bidding Strategies: First-Price, Second-Price, English, and Dutch Auctions Network Games: Strategic Interactions on Graphs and Network Formation Current Trends and Research Directions in Game Theory	**8**
	TOTAL	**42**

REFERENCES

S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Osborne, M. J., & Rubinstein, A. (2020). A Course in Game Theory. MIT Press. ISBN: 978-0262650403.	2020
2	Tadelis, S. (2019). Game Theory: An Introduction (2nd ed.). Princeton University Press. ISBN: 978-0691169064.	2019
3	Myerson, R. B. (2021). Game Theory: Analysis of Conflict. Harvard University Press. ISBN: 978-0674728626.	2021