

2CSPE405		GAME THEORY AND ITS APPLICATIONS		SEMESTER VII			
PREREQUISITES			CATEGORY	PE	Credit		3
NIL			Hours/Week	L	T	P	TH
				3	0	0	3
<b>Course Objectives:</b>							
1.	To understand the principles and strategies of games theory						
2.	To solve the real time games and present its optimized solution						
3.	To apply the concept of games theory to identify the certainty of games.						
<b>UNIT I</b>	<b>GAMES</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Games: Reasoning about Behavior in Game – Best responses and Dominant Strategies – Nash Equilibrium – Mixed Strategies – Pareto Optimality – Dominated strategies and dynamic strategies.							
<b>UNIT II</b>	<b>NON-COOPERATIVE GAMES</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Discrete static games – Continuous static games – Relation to other Mathematical Problems: Nonlinear optimization – Fixed point problems.							
<b>UNIT III</b>	<b>EQUILIBRIA AND DYNAMIC GAMES</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Existence of Equilibria – Computation of Equilibria – Special matrix games – Uniqueness of Equilibria – Repeated and Dynamic games – Games under uncertainty.							
<b>UNIT IV</b>	<b>COOPERATIVE GAMES</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Solutions based on characteristic function – Conflict Resolution – Multi objective optimization – Social choice.							
<b>UNIT V</b>	<b>CASE STUDIES AND APPLICATIONS</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
A salesman,s Dilemma – Oligopoly in water management – A forestry management problem – International fishing – Water distribution problem.							
<b>Total(45 L)=45 Periods</b>							

<b>Text Books:</b>	
1.	David Easley and Jon Kleinberg, “ Networks, Crowds and Markets: Reasoning about a highly Connected World”, Cambridge University, 2010 (Unit I).
2.	Matsumoto A., Szidarovszky F, "Game Theory and Applications", Springer, 2016 (Units II –V).
<b>Reference Books:</b>	
1.	E.M.Barron, "Game Theory: An Introduction", Wiley, 2009.
2.	Leon Petrosjan, Valdimir V.Mazalov, "Game Theory &Applications", Nova Science Publishers, Inc, 2015.

<b>Course Outcomes:</b>		<b>Bloom’s Taxonomy Mapped</b>
Upon completion of this course, the students will be able to:		
CO1	Understand the principles and strategies of games theory	L1 & L2
CO2	Solve the real time games and present its optimized solution	L5 & L6
CO3	Apply the concept of games theory to identify the certainty of games.	L3

**COURSE ARTICULATION MATRIX**

<b>COs/POs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO4</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	3	2	1										2	1
CO2	3	2	1										2	1
CO3	3	2	1										2	1
<b>Avg</b>	<b>3</b>	<b>2</b>	<b>1</b>										<b>2</b>	<b>1</b>

3 / 2 / 1 – indicates strength of correlation (3-High,2-Medium,1-Low)