III Year I Semester	L	T	P	C
Code: 20CY56B0	3	0	0	3

SOCIAL NETWORKS (Honors)

Course Objectives:

1. Formalize different types of entities and relationships as nodes and edges and represent this information as a relational data.
2. Plan and execute network analytical computations
3. Useadvancednetworkanalysissoftwaretogeneratevisualizationsandperformempiricalinvestigationsofnetworkdata
4. Interpret and synthesize the meaning of the results with respect to a question, goal, or task
5. Collect network data in different ways and from different sources while adhering to legal standards and ethics standards

Course Outcomes:

After completing the course student should:

1. Know basic notation and terminology used in network science
2. Be able to visualize, summarize and compare networks
3. Illustrate basic principles behind network analysis algorithms
4. Develop practical skills of network analysis in R programming language
5. Be capable of analyzing real work networks

UNIT I

Social Network Analysis: Preliminaries and definitions, Erdos Number Project, Centrality measures, Balance and Homophily.

UNIT II

Random graph models**:** Random graphs and alternative models, Models of network growth, Navigation in social Networks, Cohesive subgroups, Multidimensional Scaling, Structural equivalence, roles and positions.

UNIT III

Network topology and diffusion, Contagion in Networks, Complex contagion, Percolation and information, Navigation in Networks Revisited.

UNIT IV

Small world experiments, Small world models, origins of small world, Heavy tails, Small Diameter, Clustering of connectivity, The Erdos Renyi Model, Clustering Models.

UNIT V

Network structure -Important vertices and page rank algorithm, towards rational dynamics in networks, basics of game theory, Coloring and consensus, biased voting, network formation games, network structure and equilibrium, behavioral experiments, Spatial and agent-based models.

Text Books:-

1. S.Wasserman and K.Faust.“Social Network Analysis: Methods and Applications”, Cambridge University Press.
2. D.EasleyandJ.Kleinberg,“Networks,CrowdsandMarkets:Reasoningaboutahighlyconnectedworld” ,Cambridge UniversityPress,1stedition,2010

Reference Books:-

1. Maarten van Steen."Graph Theory and ComplexNetworks.AnIntroduction",2010.
2. RezaZafarani, Mohammed Ali Abbasi, HuanLiu. "Social Media Mining: An Introduction". Cambridge University Press 2014.
3. Maksim Tsvetovat and Alexander Kouznetsov. "Social Network Analysis for Startups". O'ReillyMedia,2011.

e-Resources:

1) https://www.classcentral.com/course/edx-social-network-analysis-sna-9134
2) https://www.coursera.org/learn/social-network-analysis