SUBJECT NO-CS60078, SUBJECT NAME- COMPLEX NETWORK THEORY

LTP- 3-0-0,CRD- 3

SYLLABUS :-

ObjectivesÃ¢ÂÂ¢Study of the models and behaviors of networked systems.Ã¢ÂÂ¢Empirical studies of social, biological, technological and information networks.Ã¢ÂÂ¢Exploring the concepts of small world effect, degree distribution, clustering, network correlations, random graphs, models of network growth, and preferential attachment and dynamical processes taking place on networks.ContentTypes of network: Social networks, Information networks, Technological networks, Biological networks.Properties of network: Small world effect, transitivity and clustering, degree distribution, scale free networks, maximum degree; network resilience; mixing patterns; degree correlations; community structures; network navigation.Random Graphs: Poisson random graphs, generalized random graphs, the configuration model, power-law degree distribution, directed graph, bipartite graph, degree correlations.Models of network growth: Prices model, Barabasi and Alberts model, other growth models, vertex copying models.Processes taking place on networks: Percolation theory and network resilience, Epidemiological processes.Applications: Search on networks, exhaustive network search, guided network search, network navigation; network visualization.References1.S. N. Dorogovtsev and J. F. F. Mendes, Evolution of Networks, Oxford University Press.2.Narsingh Deo, Graph Theory, Prentice Hall of India.3.Current Literature.