COURSE CODE	COURSE TITLE	L	T	P	C
UCS1722	SOCIAL NETWORK ANALYSIS	3	0	0	3

OBJECTIVES

- To understand the concepts of social network analysis and formally represent social network
- To use SNA tools for applying community detection algorithms and visualization on online social network
- To know the various applications of social network analysis.

UNIT I INTRODUCTION 9

Social Network Analysis: Development of social network analysis -- Key concepts and measures in network analysis -- Electronic Sources for Network Analysis: Electronic discussion networks -- Blogs and online communities -- Web-based networks -- Social Network Data: Introduction -- Boundary specification and sampling -- Types of networks -- Network data -- Measurement and collection.

UNIT II MATHEMATICAL REPRESENTATION OF SOCIAL NETWORKS 9

Notations for Social Networks: Graph theoretic notations -- Sociometric notations -- Algebraic notations -- Two sets of actors -- Graph and matrices.

UNIT III COMMUNITY DETECTION METHODOLOGIES, APPLICATIONS 9

Introduction -- Definition of communities -- Evaluating communities -- Methodologies of Network Community Mining: Optimization based algorithms -- Heuristic methods -- Other methods -- Applications of community mining algorithms -- Multi-Relational characterization of dynamic social network communities.

UNIT IV PRACTICAL APPROACH TO SOCIAL NETWORK ANALYSIS 9

Graph Theory: Introduction; SNA Tool: Python and NetworkX -- Centrality; Clique, Clusters and Components: Components and Subgraphs -- Triads -- Cliques -- Hierarchical Clustering; 2-Mode networks; A dynamic model in Python.

UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETOWRKS 9

Visualizing online social networks -- Visualizing social networks with matrix-based representations -- Node-Edge diagrams -- Matrix and Node-Link Diagrams -- Hybrid representations; Applications: Covert networks -- Community welfare -- Collaboration networks -- Co-citation networks.

TOTAL PERIODS: 45

OUTCOMES

On successful completion of this course, the student will be able to

- Explain Social network concepts, measures and data (K2)
- Represent social networks mathematically (K2)

- Understand the working of community detection algorithms for online Social networks (K2)
- Use SNA tools for analysing social networks (K3)
- Apply Visualization to social networks (K3)

TEXTBOOKS

1. Peter Mika, “Social Networks and the Semantic Web”, 1st Edition, Springer,2007.
1. (Unit I)
2. StanleyWasserman, Katherine Faust, “Social Network Analysis Methods and Applications”, 1st Edition,Cambridge University Press, 1994. (Unit I and Unit II)
3. Maksim Tsvetovat and Alexander Kouznetsov, “Social Network Analysis for Startups”, O’Reilly, 2011. (Unit IV)
4. BorkoFurht, “Handbook of Social Network Technologies andApplications”,1st Edition,Springer, 2010. (Unit III and Unit V)

REFERENCE BOOKS

1. John Scott, “Social Network Analysis”, 4th Edition,SAGE Publications,2017.
2. Stephen P Borgatti, MartinG Everett,Jeffrey G Johnson, “Analyzing Social Networks”, SAGE Publications, 2nd Edition,2018.
3. Robert A Hanneman, Mark Riddle, “Introduction to social network methods”, University of California, Riverside, 2005.
4. Charles Kadushin, “Understanding Social Networks: Theories, Concepts, and Findings”, 1st Edition,Kindle Edition,Oxford University Press, 2012.
5. Guandong Xu, Yanchun Zhang, Lin Li, “Web Mining and Social Networking – Techniques and applications”, 1st EditionSpringer, 2011.