CSE 4012 SOCIAL NETWORK ANALYSIS [3 0 0 3]

Course Objectives:

- To develop the skills of Social Network Concepts and Techniques
- To represent and process Network Relations
- To familiarize with Web based Social Network Applications

Course Outcomes:

At the end of the course, students will be able to

- Understand and visualize the basic concepts of network structure and representation of Social Network Analysis
- Analyze the Social Network structure and its visualize them in the form of layouts
- Apply the Social Network Concepts in solving problems related to social, personal, business and international levels
- Understand and Implement the algorithm for discovering communities in Social Networks
- Understand the algorithm and models for social influence analysis

1. INTRODUCTION:
   Analyzing the Social Web, A brief history of the Social Web, Websites discussed, Tools used
   (Chapter 1 of Text Book 1) (2hrs)

2. NODES, EDGES AND NETWORK MEASURES:
   Basics of Network Structure, Representing Networks, Basic Network Structures and Properties.
   (Chapter 2 of Text Book 1) (3 hrs)

3. NETWORK STRUCTURE AND MEASURES:
   Describing Nodes and Edges, Describing Networks
   (Chapter 3 of Text Book 1) (5 hrs)

4. NETWORK VISUALIZATION:
   Layouts, Visualizing Network features
   (Chapter 4 of Text Book 1) (4 hrs)

5. TIE STRENGTH:
   The role of Tie Strength, Measuring Tie Strength, Tie Strength and Network Structure, Tie Strength and Network Propagation
   (Chapter 5 of Text Book 1) (4 hrs)

6. ENTITY RESOLUTION AND LINK PREDICTION:
   Link Prediction, Entity Resolution, Link Prediction: Case Study – Friend Recommendation.
   (Chapter 9 of Text Book 1) (5 hrs)

7. COMMUNITY DISCOVERY IN SOCIAL NETWORKS:

Introduction to Community Discovery, Communities in Context, Quality Functions, The Kernighan-Lin algorithm, Agglomerative/Divisive Algorithms, Spectral Algorithms, Multi-level Graph Partitioning, Markov Clustering, Other Approaches.

(Chapter 4 of Text Book 2) (7 hrs)

8. MODELS AND ALGORITHMS FOR SOCIAL INFLUENCE ANALYSIS:

Introduction to Social Influence, Influence Related Statistics, Social Similarity and Influence, Homophily, Existential Test for Social Influence, Influence and Actions, Influence and Interaction, Influence Maximization in Viral Marketing, Other Applications.

(Chapter 7 of Text Book 2) (6 hrs)

Text Books :

1. Jennifer Goldbeck, "*Analyzing the Social Web*", Morgan Kaufmann Publications, 2013
2. Charu C. Aggarwal, "*Social Network Data Analytics*", Springer Publications, 2011

References :

1. John Scott, "*Social Network Analysis*", Third edition, , SAGE Publications Limited, 2013.
2. Stanley Wasserman, Katherine Faust, "*Social Network Analysis Methods and Applications*", Cambridge University Press, 1994
3. Jay Goldman, "*Facebook Cookbook*", O'Reilly, 2009
4. Richard Wagner, "*Building Facebook Applications for Dummies*", Wiley Publishing Inc., 2008.
5. Shamanth Kumar, Fred Morstatter, Huan Liu, "*Twitter Data Analytics*", Springer Publications, 2013