INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

SOCIAL NETWORKS								
VI Semester: IT								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
AITD10	**Elective**	3	0	0	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Computer Networks								

I. COURSE OVERVIEW

This course provides an in-depth study of social networks, focusing on their structure, dynamics, and impact. It covers theoretical foundations, computational methods, and practical applications in analyzing social connections and behaviors. Students will explore models and algorithms used to study relationships, influence, and information flow in social networks.

II. COURSES OBJECTIVES:

The students will try to learn:

I. Fundamental concepts of social network
II. Network properties such as centrality, connectivity, and clustering.
III. Computational tools to visualize and interpret real-world social network data.
IV. Examine ethical and privacy concerns related to social networks.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1 Develop semantic web applications**.**
CO2 Represent social network data using the principles of Ontology.
CO3 Define community and methods for community detection and mining.
CO4 Implement community mining algorithms to extract knowledge from Social Network
CO5 Predict human behavior in social web and related communities
CO6 Use visualization tools to represent the knowledge of social network data.

IV. COURSE CONTENT:

MODULE - I: INTRODUCTION (09)

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - 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 - Applications of Social Network Analysis.

MODULE–II: MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION (09)

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modelling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

MODULE - III: EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS (08)

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining.

Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi-Relational characterization of dynamic social network communities.

MODULE – IV: PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES (10)

Understanding and predicting human behaviour for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic, Trust network analysis Trust transitivity analysis - Combining trust and reputation - Trust derivation based on trust comparisons - Attack spectrum and countermeasures.

MODULE – IV: VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS (09)

Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix representation - Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams - Hybrid representations - Applications - Cover networks - Community welfare - Collaboration networks - Co-Citation networks.

V. TEXTBOOKS:

1. Peter Mika, “Social Networks and the Semantic Web”, 1st Edition, Springer 2007.
2. BorkoFurht, “Handbook of Social Network Technologies and Applications”, 3rdEdition, Springer, 2015.

VI. REFERENCE BOOKS:

1. GuandongXu ,Yanchun Zhang and Lin Li, “Web Mining and Social Networking – Techniques and applications”, First Edition Springer, 2011.
2. Dion Goh and Schubert Foo, “Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively”, IGI Global Snippet, 2008.
3. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, “Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling”, IGI Global Snippet, 2009.

VII. ELECTRONICS RESOURCES:

1. https://visiblenetworklabs.com/guides/social-network-analysis-101/
2. https://www.acspri.org.au/courses/introduction-social-network-research-and-analysis-online

3. https://onlinecourses.nptel.ac.in/noc19_cs66/preview

VII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech-talk topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)