



**CVM**  
**UNIVERSITY**

Aegis: Charutar Vidya Mandal (Estd.1945)

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**Effective from Academic Batch: 2022-23**

**Programme:** M.TECH ARTIFICIAL INTELLIGENCE

**Semester:** III

**Course Code:** 202310303

**Course Title:** Social Network Analysis

**Course Group:** Programme Elective-IV

**Course Objectives:**

The course is aimed to understand the components of the social network, to model and visualize the social network, to mine the users in the social network. Students will understand the evolution of the social network and applications in real time systems.

**Teaching & Examination Scheme:**

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	0	2	4	50/20	50/20	25/10	25/10	150/60

\* J: Jury; V: Viva; P: Practical

**Detailed Syllabus:**

Sr.	Contents	Hours
1	<b>Introduction:</b> Introduction to Web - Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Statistical Properties of Social Networks -Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis - Discussion networks - Blogs and online communities - Web-based networks.	05
2	<b>Model and Visualization:</b> Visualizing Online Social Networks - A Taxonomy of Visualizations - Graph Representation - Centrality- Clustering - Node-Edge Diagrams - Visualizing Social Networks with Matrix- Based Representations- Node-Link Diagrams - Hybrid Representations - Modelling and aggregating social network data – Random Walks and their Applications –Use of Hadoop and Map Reduce - Ontological representation of social individuals and relationships.	05



<b>3</b>	<b>Mining Communities:</b> Aggregating and reasoning with social network data, Advanced Representations – Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities – Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks.	08
<b>4</b>	<b>Evolution:</b> Evolution in Social Networks – Framework - Tracing Smoothly Evolving Communities - Models and Algorithms for Social Influence Analysis - Influence Related Statistics - Social Similarity and Influence - Influence Maximization in Viral Marketing - Algorithms and Systems for Expert Location in Social Networks - Expert Location without Graph Constraints - with Score Propagation – Expert Team Formation - Link Prediction in Social Networks - Feature based Link Prediction – Bayesian Probabilistic Models - Probabilistic Relational Models.	08
<b>5</b>	<b>Applications:</b> A Learning Based Approach for Real Time Emotion Classification of Tweets, A New Linguistic Approach to Assess the Opinion of Users in Social Network Environments, Explaining Scientific and Technical Emergence Forecasting, Social Network Analysis for Biometric Template Protection	07

### List of Practicals / Tutorials:

<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	
<b>9</b>	
<b>10</b>	

### Reference Books:

<b>1</b>	Ajith Abraham, Aboul Ella Hassanien, Václav Snášel, –Computational Social Network Analysis: Trends, Tools and Research Advances, Springer, 2012
<b>2</b>	Borko Furht, –Handbook of Social Network Technologies and Applications, Springer, 1 st edition, 2011
<b>3</b>	Charu C. Aggarwal, –Social Network Data Analytics, Springer; 2014 Giles, Mark Smith, John Yen, –Advances in Social Network Mining and Analysis, Springer, 2010.
<b>4</b>	Guandong Xu , Yanchun Zhang and Lin Li, –Web Mining and Social Networking – Techniques and applications, Springer, 1st edition, 2012
<b>5</b>	Peter Mika, –Social Networks and the Semantic Web, Springer, 1st edition, 2007. Przemyslaw Kazienko, Nitesh Chawla, Applications of Social Media and Social Network Analysis, Springer, 2015
<b>6</b>	Statistics for Spatio-Temporal Data, Wiley Publication, by Noel Cressie, Christopher K. Wikle



## Supplementary learning Material:

1	Lecture Note
2	NPTEL Social Networks: <a href="https://onlinecourses.nptel.ac.in/noc19_cs66/preview">https://onlinecourses.nptel.ac.in/noc19_cs66/preview</a>

## Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation
- Industrial/ Field visits
- Course Projects

## Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

## Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	U	A	N	E	C	
15%	40%	30%	10%	5%		

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Work on the internals components of the social network.	30
CO-2	Model and visualize the social network	45
CO-3	Mine the behavior of the users in the social network.	25

## Curriculum Revision:

Version:	2.0
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025