

**Prasad V. Potluri Siddhartha Institute of Technology:: Vijayawada.**  
**Department of Computer Science and Engineering**

**I/II M.Tech. (CSE) (First Semester)**

**17CSCS2T6C****SOCIAL MEDIA and GRAPH ANALYTICS****Credits: 4**

**Elective - IV**

**Lecture: 4 Periods/week**

**Internal Assessment: 40 Marks**  
**Semester end examination: 60 Marks**

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### **Course Description**

The main theme of the course is focused on Mathematical foundations of Social Media Analysis, Graph-Based Social Media Analysis that provides a comprehensive use of graph analysis, in the study of Social Media and Digital Media. It addresses an important scientific and technological challenge such as graph analysis and linear algebra, digital media, machine learning and Big-data analysis.

### **Course Outcomes:**

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

- CO1:** Able to apply the statistical properties such as static and dynamic properties in Social Networks.
- CO2:** Able to get the knowledge on Algebraic graph analysis and then apply on social and digital media.
- CO3:** Able to learn Random Walk algorithms for graph clustering.
- CO4:** Able to learn community discovery in Social Networks, and classification in Social networks.

### **Unit-1**

Mathematical Preliminaries: Graphs and Matrices, Graphs in Social and Digital media.  
Introduction to Social Network Data Analytics

### **Unit-2**

Statistics Properties of Social Networks – Preliminaries, Static Properties, Dynamic Properties. Algebraic Graph Analysis – Spectral Graph theory, Applications of Graph Analysis, Random Graph generation, Graph Clustering, Random Walks.

**Unit-3**

Community Discovery in Social Networks – Introduction, Communities in Context, Core Methods, Emerging Fields and Problems. Classification in Social Networks – Classification Problem, Classification methods in Social Networks – Local Classifiers, Inference using Graphical Models, Bayesian Probabilistic models.

**Unit-4**

Privacy in Social Networks – Privacy breaches in Social Networks, privacy Definitions for publishing data, Privacy-Preserving mechanisms. Visualization in Social Networks – A Taxonomy of Visualizations.

**Text Books:**

1. Graph-Based Social Media Analysis, Ioannis Pitas, CRC Press, 2016.
2. Social Networks Data Analytics, Charu C. Agarwal, Springer, 2011

**Reference Books:**

1. Fraud Analytics using Descriptive, Predictive and Social Network Techniques, Bart Baesens, Veronique Van Vlasselaer and Wouter Verbeke, Wiley Series, 2015.