

| III Year B.Tech | SEMESTER-2                        | L | T | P | C |
|-----------------|-----------------------------------|---|---|---|---|
| Code:CS1204     | Introduction to Social Networking | 1 | 1 | 0 | 2 |

### Learning Objectives

The learning objective is to provide students with essential knowledge of network analysis applicable to real world data, with examples from today's most popular social networks.

### Learning outcomes

After completing the study of the course the student should:

- ☐ Know basic notation and terminology used in network science
- ☐ Be able to visualize, summarize and compare networks
- ☐ Understand basic principles behind network analysis algorithms
- ☐ Develop practical skills of network analysis in R programming language
- ☐ Be capable of analyzing real work networks

### Course Syllabus

#### UNIT-I

Introduction to social network, Networks examples. Graph theory basics, Statistical network properties, Node centrality metrics: degree, closeness and betweenness centrality. Eigenvector centrality and PageRank.

#### UNIT-II

Network models: Properties of real world networks, Random Graph model, Small world model, Preferential attachment model, Community Structure: Community detection, Community Evolution, Community evaluation.

#### UNIT-III

Process on networks: network topology and diffusion, complex contagion, innovation and coordination, Cool and unusual Applications, predicting recipe ratings using ingredient networks, Network Resilience, Resilience and assortivity, Network visualization,. Data mining and text mining.

### Text Books:

- David Easley and John Kleinberg. "Networks, Crowds, and Markets: Reasoning About a Highly Connected World." Cambridge University Press 2010.
- Eric Kolaczyk, Gabor Csardi. "Statistical Analysis of Network Data with R (Use R!)". Springer, 2014.
- Stanley Wasserman and Katherine Faust. "Social Network Analysis. Methods and Applications." Cambridge University Press, 1994

### Reference Books:

- Maarten van Steen. "Graph Theory and Complex Networks. An Introduction", 2010.
- Reza Zafarani, Mohammed Ali Abbasi, Huan Liu. "Social Media Mining: An Introduction" . Cambridge University Press 2014.

4. Maksim Tsvetovat and Alexander Kouznetsov. “Social Network Analysis for Startups”. O’Reilly Media, 2011.
5. Robert Knell. “ Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and Programming in R ”, 2013
6. Robert Kabacoff. “R in action. Data Analysis and graphics with R”, Manning Publications, 2011

**Useful Links:**

<http://www.r-project.org>

<http://www.rstudio.com>

<http://igraph.org>