# 20IT32E3 - SOCIAL INFORMATION NETWORKS

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| Course Category: | Professional Elective | Credits: | 3 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 3-0-0 |
| Prerequisite: | An understanding of graph theory is desirable | Sessional Evaluation:  Univ. Exam Evaluation:  Total Marks: | 40  60  100 |
| Objectives: | * Understand the components of the social network. * Understand the patterns in complex social network. * Familiarize the graph theory concepts of the social network. * Analyze the statistical models for social network. | | |

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| Course Outcomes | Upon successful completion of the course, the students will be able to: | |
| CO1 | Understand the subject related concepts and of contemporary issues |
| CO2 | Gain knowledge about the importance of graph theory in social networks. |
| CO3 | Implement the patterns in complex social networks. |
| CO4 | Identify the relationships among social positions and social roles. |
| CO5 | Understand the stochastic assumptions about the relational data in a social network. |
| CO6 | Explore the basics of statistical models for attaining structural hypothesis. |
| Course Content | UNIT-I  **Introduction**  Introduction to social network analysis – Fundamental concepts in network analysis – social network data – notations for social network data – Graphs and Matrices.  UNIT-II  **Centrality and Prestige**  Nondirectional Relations- Degree Centrality, Closeness Centrality, Betweenness Centrality,  Directional Relations- Centrality, Prestige, Comparisons and Extensions  UNIT-III  **Structural Equivalence**  Background, Definition of Structural Equivalence, Positional Analysis, Measuring Structural Equivalence- Euclidean Distance as a Measure of Structural Equivalence, Correlation as a Measure of Structural Equivalence.  UNIT-IV  **Block Models**  Definition, Building Blocks- Perfect Fit (Fat Fit), Zero block (Lean Fit) Criterion, One block Criterion, α Density Criterion, Interpretation: Actor Attributes, Describing Individual Positions  UNIT-V  **Dyads**  An Overview, Dyads, Simple Distributions: The Uniform Distribution - A Review, Simple Distributions on Digraphs, Statistical Analysis of the Number of Arcs, Statistical Analysis of the Number of Mutuals.  UNIT-VI  **Triads**  Random Models and Substantive Hypotheses, Triads, Distribution of a Triad Census: Mean and Variance of a Triad Census, Mean and Variance of Linear Combinations of a Triad Census, Testing Structural Hypotheses: Configurations, From Configurations to Weighting Vectors, From Weighting Vectors to Test Statistics | |
| Text Books &  Reference  Books | **TEXT BOOKS:**   1. Stanley Wasserman, Katherine Faust, Social network analysis: Methods and applications, Cambridge university press, 2009.   **REFERENCE BOOKS:**   1. M.E.J. Newman, Networks: An introduction, Oxford University Press, 2010. 2. Easley and Kleinberg, Networks, Crowds, and Markets: Reasoning about a highly connected world. Cambridge University Press, 2010. 3. Matthew Jackson, Social and Economic Networks. Princeton Univ. Press, 2008. 4. Charu Aggarwal, Social Network data analysis, Springer, 2011. 5. John Scott, Social network analysis, 3rd edition, SAGE, 2013 | |
| E-Resources | 1. <https://nptel.ac.in/courses/106106169> | |