REPORT OF WORKSHOP ON SPECRAL GRAPHTHEORY

A research workshop on Spectral Graph Theory was conducted on 11th February 2025, featuring Ms. Remna K P as the resource person. The workshop aimed to introduce participants to the fundamental concepts of spectral graph theory and its applications in various fields such as network analysis, machine learning, and combinatorial optimization. Spectral Graph Theory is a fascinating field that combines linear algebra and graph theory to analyze and understand complex networks. By studying the eigen values and eigenvectors of graph matrices, researchers can uncover hidden patterns, properties, and behaviors of networks, with applications in computer science, physics, and data analysis.

Ms. Remna K P began the session with an introduction to graph theory and its spectral properties, explaining key concepts such as the Laplacian matrix, adjacency matrix, and eigenvalues of graphs. She elaborated on how spectral techniques can be used to analyze the structural properties of graphs, including connectivity, graph partitioning, and robustness.

Interactive Discussion & Hands-on Session

The workshop included an interactive Q&A session, where participants engaged with Ms. Remna K P on advanced topics such as the Cheeger's inequality, spectral gap, and expander graphs. Additionally, a hands-on session was conducted where attendees used Python and libraries like NetworkX and SciPy to compute eigenvalues and analyze graph structures.

Conclusion

The workshop successfully provided participants with a deeper understanding of spectral graph theory and its interdisciplinary applications. Ms. Remna's insights and engaging delivery made the session highly informative and thought-provoking. The event concluded with a vote of thanks by Haseena C, Assistant Professor, Mahatma Gandhi College Iritty, appreciating her valuable contribution and encouraging further research in the field.