

## **CHRIST (Deemed to be University), BANGALORE**

Report on Summer School held on Graph Theory in April 2018

Aim of the workshop

- To introduce students to the essence and basics of ‘Graph Theory’ with research oriented teaching methodology and internal and external research personnel
- To motivate students into higher studies and research in the field.

Participants

The second year undergraduate students of the B.Sc. combinations of PCM, PME, CME, and CMS were in attendance to make an interactive class of 17 students over the course of 20 days.

Resource People

- Fr Joseph Varghese
- Dr Sangeetha Shathish
- Dr Tabitha Rajashekar
- Dr. Mukti Acharya
- Dr. G Ravindra
- Dr. Lourduswamy

Discourse of the Summer School

The students having little to none previous exposure to the topics in Graph Theory were introduced to the subject at a comfortable pace and depth beginning with thought provoking puzzles that seeded the beginning of Graph Theory such as the Konigsberg Problem. Discussion was encouraged on the topics with a mention of the history behind the subject as well as the mathematicians involved in it.

The basics of graph theory was thoroughly discussed enabling much self-learning in the future as well as the capability to follow lectures on research being done in the subject. Topics dealt were classes of graphs and their characteristics, length, distance, eccentricity, diametral paths, degree sequence, handshake property, subgraphs, isomorphism, adjacency matrices, Eulerian and Hamiltonian circuits, types of colouring, colour energy, independence number, clique number, chromatic number, density, perfect graphs, dominations, hypercubes, planar graphs, Euler’s formula, Kuratowski theorem, weighted graphs, trees, signed graphs, graceful trees, neighbourhood, and domatic number.

All topics were introduced keeping in mind a real world necessity and the origin of the concept giving the student a context and research oriented thought process. Problem solving sessions took place with minimal interference from the instructors allowing the student to follow individual paths to the solution teaching themselves to correct their course and arrive at the solution making a great learning experience. The discussion also involved a great deal of sharing of individual research as well giving insight into research methodology and culture. The students were encouraged to work on existing open problem as well as find avenues of research of their own liking. The summer schools was greatly appreciated and very well received by the students. It gave the faculty a refreshing experience of teaching introductory graph theory to an enthusiastic set of undergraduates.



