



MATHEMATICS

GRAPH THEORY



PROF. SOUMEN MAITY
Department of Mathematics
IISER Pune

TYPE OF COURSE : Rerun | Elective | UG/PG

COURSE DURATION : 8 weeks (28 Jan'19 - 22 Mar'19)

INTENDED AUDIENCE : B.Sc, M.Sc, B.Tech, M.Tech

EXAM DATE : 31 Mar 2019

INDUSTRIES APPLICABLE TO : It will be recognized by several industries & academic institutes

COURSE OUTLINE :

Graph theory began in 1736 when the Swiss mathematician Euler solved Königsberg seven-bridge problem. It has been two hundred and eighty years till now. Graph theory is the core content of Discrete Mathematics, and Discrete Mathematics is the theoretical basis of computer science and network information science. This course introduces in an elementary way some basic knowledge and the primary methods in Graph Theory.

ABOUT INSTRUCTOR :

Prof. Soumen Maity is an Associate Professor of Mathematics at Indian Institute of Science Education and Research (IISER) Pune. He received a PhD from the Theoretical Statistics & Mathematics Unit at Indian Statistical Institute (ISI) Kolkata, India in 2002. He has postdoctoral experience from Lund University, Sweden; Indian Institute of Management (IIM) Kolkata, India; and University of Ottawa, Canada. Prior to joining IISER Pune in 2009, he worked as Assistant Professor at IIT Guwahati and IIT Kharagpur.

COURSE PLAN :

Week 01 : Paths, Cycles, Trails, Eulerian Graphs, Hamiltonian Graphs

Week 02 : Bipartite graphs, Trees, Minimum Spanning Tree Algorithms

Week 03 : Matching and covers

Week 04 : Maximum matching in Bipartite Graphs

Week 05 : Cuts and Connectivity

Week 06 : 2-connected graphs

Week 07 : Network flow problems, Ford-Fulkerson algorithm

Week 08 : Planar graphs; Coloring of graphs