Sankalchand Patel University

Faculty Of Science

M.Sc. Mathematics (SEM-III)

In Effect from Academic Year 2017-18

Subject Code: 1SC2040304	**Subject Title: Graph Theory –I**

Course Objective:

- This course is designed to enable students to acquire basic understanding of the graph theory, its concepts and applications.

Teaching scheme (hours) per week		**credit**		**Theory Marks**		**Practical Marks**		**Total**
Theory	**Tutorial**	**Theory**	**Tutorial**	**University Assessment**	**Cont. Assessment**	**University Assessment**	**Cont. Assessment**	
4	**1**	**4**	**1**	**60**	**40**	**-**	**-**	**100**

Subject Contents			
Unit. No	**Topic**	**Total Hours**	**Weight (%)**
1	Review of basic facts about graphs: connected graph, tree, Euler graph, fundamental circuits, matrix representation of graphs. Directed Graphs: definitions and examples, vertex degrees, some special types of digraphs, directed path and connectedness, Euler digraphs.	18	25
2	Directed graphs (conti.): trees with directed edges, spanning out-tree and spanning n-tree, fundamental circuits in digraphs, matrices A and B of digraphs, adjacency matrix of digraph.	18	25
3	Chromatic number, chromatic partitioning, chromatic polynomial, Four-color Problem, Hamiltonian cycles: necessary conditions, sufficient conditions, isomorphic graphs.	18	25
4	Matching and covers: maximum matching, Hall's matching condition, minmax theorems, independent sets, vertex cover, edge cover.	18	25

Course Outcome:

On successful completion of the course, students should be able to

- Understand the concept of graph, path.
- Develop an understanding of adjacency matrix of a graph
- Know about the applications of graph w.r.t colouring of graphs, matching and covers.

List of References:

- Narsingh Deo: Graph Theory with applications to Engg. And Computer Science. Prentice-Hall of India Pvt. Ltd., New Delhi, 1999.
- Douglas B. West: Introduction to Graph Theory.
- John Clark and D.A. Holton: A first look at graph theory Allied Publishing Ltd., 1991.
- Robin J. Wilson: Introduction to graph theory.