



Course Name: Master of Science

Discipline: Mathematics

(For those who join in 2015 and after)

Self Learning Course:

Subject	Credit	Ext =Tot	Subject Code
Research Topics in Mathematics	5	100 = 100	P1MASL1

RESEARCH TOPICS IN MATHEMATICS

Credit: 5

Subject code: P1MASL1

TOTAL MARKS : 100

Objectives:

- To motivate the students to learn about completeness in functions spaces and the notion of various convergence in the topological spaces.
- To motivate the students to learn about the regular and semi regular graphs and some interesting properties of switching in graphs

Unit I: Regular and Semi regular graphs: Basic definitions – Semi regular graphs – Results.

(Text Book 1: Chapter 1)

Unit II: Switching in Graphs: Basic Definitions – Self vertex Switching – Results.

(Text Book 1: Chapter 2)

Unit III: Copairs and Dual copairs: Definition – Examples - Characterisation and Enumeration.

(Text Book 1: Chapter 5)

Unit IV: Complete Metric Spaces and Function Spaces: Complete metric spaces – A space-Filling curve

(Text Book 2: Chapter 7: Sections 43, 44)

Unit V: Complete Metric Spaces and Function Spaces: Compactness in metric spaces – Pointwise and compact convergence

(Text Book 2: Chapter 7: Sections 45 and 46)

Text Book(s)

1. Selvam Avadayappan and M. Bhuvaneshwari, An introduction to research in Mathematics 2015
2. James R. Munkres, Topology, Second Edition, Pearson Education, India, 2001

Reference Book(s)

- 1 Selvam Avadayappan and M. Bhuvaneshwari, Characterization of Copair Integers, Journal of Modern Science, Vol.4- No.1, 45-47, February 2012.
- 2 Selvam Avadayappan and M. Bhuvaneshwari, Some results on self vertex switching, Notes on Number Theory and Discrete Mathematics, Vol. 20, 2014, No. 4.



- 3 R.Balakrishnan and K. Ranganathan A Text Book of graph Theory, Springer-verlag, New York, Inc(1999) .
- 4 C. Jayasekaran, *Self vertex switchings of connected graphs*, Proceedings of the national conference on the emerging trends in Pure and Applied Mathematics held at St. Xavier's College, Palayamkottai, Tamilnadu, India 2005, pp. 154-160.
- 5 C. Jayasekaran, *On Interchange Similar Self vertex switchings of Graphs*, International Journal of Algorithms, Computing and Mathematics, Volume 3, Number 1, February 2010, pp 59-64.
- 6 C. Jayasekaran, *Graphs with a given number of self vertex switchings*, International Journal of Algorithms, Computing and Mathematics, Volume 3, Number 3, August 2010, pp 27 – 36.
- 7 Alison Northup, *A study of Semiregular graphs*, Stetson University, 2002.
- 8 James Dugunji, *Topology*, Printice-Hall of India Pvt Ltd, 1975
- 9 J. L. Kelley, *General Topology*, Springer-Verlag, New York, 1991