



Course Name : Master of Science Discipline : Mathematics CHOICE BASED CREDIT SYSTEM (For those who joined in June 2022 and after) Course Scheme:

Self-Learning Course:

| Subject | Credit | Ext =Tot | Subject Code |
|--------------------------------|--------|-----------|-------------------------|
| Research Topics in Mathematics | 5 | 100 = 100 | P19MASL31/ P22MASL31 |

SELF LEARNING

RESEARCH TOPICS IN MATHEMATICS

Subject code: P19MASL31/ P22MASL31

Credit: 5 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.



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- 3 R.Balakrishnan and K. Ranganathan <u>A Text Book of graph Theory</u>, 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