

SRINIVAS



UNIVERSITY

Mukka, Mangaluru – 574146

Web : www.srinivasuniversity.ac.in

**[In compliance of University Grants Commission
(Minimum Standards and Procedures for Award of
Ph.D. Degree) Regulations, 2022]**

**COURSEWORK SYLLABUS OF
Ph.D. PROGRAMME IN
MATHAMETICS**

**INSTITUTE OF ENGINEERING AND TECHNOLOGY
SRINIVAS UNIVERSITY
Mukka Mangaluru – 574146.**

A. COURSE WORK PATTERN**400 M**

Sl. No.	Subjects	Credits	Internal Marks	External Marks	Marks
1	Research Methodology (22SPHDRM001)	4	50	50	100
2	Advanced Graph Theory (22SPHDMAT02)	4	50	50	100
3	Analysis And Presentation Of Proposed Research Topic (22SPHDPUB003)	4	50	50	100
4	Review Of Literature (22SPHDPUB004)	4	50	50	100
Total		16	200	200	400

COURSE WORK SYLLABUS

**1. RESEARCH METHODOLOGY
(22SPHDRM001)**

Module-1

Meaning, Objectives and Characteristics of research - Research methods Vs Methodology - Types of research - Descriptive Vs. Analytical, Applied Vs. Fundamental, Quantitative Vs. Qualitative, Conceptual Vs. Empirical - Research process - Criteria of good research - Developing a research plan. Defining the research problem - Selecting the problem - Necessity of defining the problem - Techniques involved in defining the problem - Importance of literature review in defining a problem - Survey of literature - Primary and secondary sources – Development of working hypothesis.

Module -2

Research design and methods – Research design – Basic Principles- Need of research design – Features of good design – Important concepts relating to research design – Observation and Facts, Laws and Theories, Prediction and explanation, Induction, Deduction, Development of Models - Developing a research plan - Exploration, Description, Diagnosis, and Experimentation- Determining experimental and sample designs.

Module -3

Sampling design - Steps in sampling design - Characteristics of a good sample design - Types of sample designs - Measurement and scaling techniques - Methods of data collection – Collection of primary data - Data collection instruments Testing of hypotheses - Basic concepts - Procedure for hypotheses testing flow diagram for hypotheses testing - Data analysis with Statistical Packages – Correlation and Regression - Important parametric test - Chi-square test - Analysis of variance and Covariance

Module -4

Data Analysis using MS Excel Introduction to Spreadsheets Spreadsheet Functions to Organize Data, Introduction to Filtering, Pivot Tables, and Charts, Advanced Graphing and Charting. Interpretation and report writing - Techniques of interpretation - Structure and components of scientific reports - Different steps in the preparation - Layout, structure and language of the report - Illustrations and tables - Types of report - Technical reports and thesis

Module-5

Ethics in Research: Importance, Principles, Developing a code of ethics, Ethics and Respondents, Ethics and Clients, Ethics and research firm. Plagiarism. Patent and Copyrights

REFERENCES:

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2021. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R., 2015. Research Methodology: Methods and Techniques. New Age International. 418p.
3. Anderson, T. W., An Introduction to Multivariate Statistical Analysis, Wiley Eastern Pvt., Ltd., New Delhi
4. Sinha, S.C. and Dhiman, A.K., 2012. Research Methodology, EssEss Publications. 2 volumes. se knowledge base, Atomic Dog Publishing.
5. Trochim, W.M.K., 2015. Research Methods: the conci 270p.
6. Fink, A., 2019. Conducting Research Literature Reviews: From the Internet to Paper. Sage Publications
7. Intellectual Property Rights in the Global Economy: Keith Eugene Maskus, Institute for International Economics, Washington, DC, 2019
8. Subbarau NR Handbook on Intellectual Property Law and Practice Publishing Private Limited.2008 S Viswanathan Printers
9. Research Methodology, Shashi k Gupta and Praneet Rangi. Kalyani Publishers, 6th edition

Advanced Graph Theory (22SPHDMAT02)

Module-1

Varieties of graphs, walks and connectedness, degrees, intersection graphs, operations on graphs. Cut points, bridges and blocks, block graphs and cutpoint graphs. Trees - characterization of trees, centers and centroids, block cutpoint trees, independent cycles and cocycles, Matroids.

Module-2

Connectivity and line connectivity, Graphical variations of Menger's theorem, Partitions Eulerian and Hamiltonian graphs, Line graphs, properties and characterizations of line graphs, line graphs and transversability, Total graphs.

Module-3

Coverings and independence, critical points and lines, Planes and planar graphs, outerplanar graphs, Kuratowski's theorem.

Module-4

Colorability, the chromatic number, Five color theorem, Four color conjecture, The Heawood map coloring theorem, Uniquely colorable graphs, critical graphs. The adjacency matrix, incidence matrix, cycle matrix.

Module-5

Digraphs – digraphs and connectedness, directional duality and acyclic digraphs, digraphs and matrices.

Textbook/Reference Books

- 1 Graph Theory Reinhard Diestel Springer 5 th Ed., 2017
- 2 Graph Theory with Applications to Engineering and Computer Science N. Deo PHI 1 st Ed., th
- 3 Graph Theory F. Harary Addition Wesley Re ading MA 1 st Ed., 1969
- 4 Graph Theory J.A. Bondy & U.S.R. Murthy North-Holland 1st Ed., (5th Print), 1982
- 5 Graph Theory and Applications G. Appasami Sarumathi Publications 1st Ed.,

3.ANALYSIS AND PRESENTATION OF PROPOSED RESEARCH TOPIC (22SPHDPUB003)

The candidates should publish the proposed work in the conference abstract book/ proceedings/ Journal.

Article quality and its presentation carries 50% weightage as internal marks and final end exam carries 50% weightage.

Exam descriptive. Questions will be general. Answers can be in relation to his/her published

4. REVIEW OF LITERATURE (22SPHDPUB004)

The candidate should publish the review article of his/her proposed work and they should submit the proof of published paper. Review article quality and its presentation carries 50% weightage as internal marks and final end exam carries 50% weightage.

Exam Descriptive. Questions will be General. Answers can be in relation to the published review paper.

NOTE:

IA Components

DDLr completion certificate

One MOOCs/Online certificate on Research methodology

One review paper with ISSN No (Connected to fourth paper of coursework)

One paper presented in conference – Proof (Connected to third paper)

Assignment for Second paper (given by the Guide or Coordinator)

Assignment for first paper (given by the Guide or Coordinator)