SRINIVAS UNIVERSITY

Mukka, Mangaluru – 574146

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[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 COMPUTER SCIENCE

INSTITUTE OF COMPUTER SCIENCE & INFORMATION SCIENCE

City Campus, Pandeshwar,
Mangaluru – 575 001.

SRINIVAS UNIVERSITY
INSTITUTE OF COMPUTER SCIENCE & INFORMATION SCIENCE
PH.D. PROGRAMME IN COMPUTER SCIENCE
OR INFORMATION SCIENCE
SYLLABUS OF COURSEWORK

A. COURSEWORK PATTERN   **400 M**

Sl. No.	Subjects	Credits	Internal Marks	External Marks	Marks
1	Research Methodology (22SPHDRM001)	4	50	50	100
2	Advanced Topics in Computer Science (22SPHDCS002)	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**

COURSEWORK 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

2. Advanced Topics in Computer Science
(22SPHDCS002)

Module 1: NoSQL Databases: Storage architecture, CRUD operations, Querying NoSQL stores, Modifying stores, Managing evolution, Indexing & Ordering data sets, Managing transactions, Choosing among NoSQL flavors, Coexistence, Performance tuning, Tools and utilities.

Module 2: Artificial Neural Networks: Introduction, Fundamental concepts, Basic models of artificial neural network, Important terminologies of ANN, Perceptron networks, Back-Propagation network, Kohonen Self-Organizing feature maps, Learning vector quantization, Convolutional neural networks.

Module 3: Cloud Computing: Fundamentals, Deployment models, Service models, Cloud platforms, Challenges, Security issues, Business value of cloud computing.

Module 4: Data Science: Introduction, Terminologies, Basic framework and architecture, difference between data science and business analytics, importance of data science in today's business world, primary components of data science, Overview of different data science techniques, Industrial applications.

Module 5: Blockchain: Overview of block chain, Block in a block chain, Public ledgers, Cryptocurrency, Bitcoin, Smart contracts, Transactions, Distributed consensus, Public vs Private block chain, Understanding crypto currency to Block chain, Overview of security aspects of block chain, Cryptographic hash Function, Properties of a hash function, Hash pointer and Merkle tree, Digital signature, Public key cryptography.

Reference Books:
1. Shashank Tiwari, Professional NoSQL, Wiley, 2011.
2. Gaurav Vaish, Getting Started with NoSQL, Packt Publishing, 2013.
3. Sivanandam SN, Deepa SN, Principles of Soft Computing, Wiley, 2018.
4. Simon Haykin, Neural Networks & Learning Machines, Pearson, 2016.
5. Thomas Erl, Cloud Computing: Concepts, Technology & Architecture, Pearson Education, 2014.
6. Srinivasan, Cloud Computing: A Practical Approach for Learning and Implementation Pearson Education, 2014.
7. Foster Provost, Tom Fawcett, Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking, O'Reilly Media, 2013.
8. John W. Foreman, Data Smart: Using Data Science to Transform Information into Insight, Wiley Publication, 2015.
9. Melanie Swan, Block Chain: Blueprint for a New Economy, O'Reilly, 2015.
10. Anshul Kaushik, Block Chain and Crypto Currencies, Khanna Publishing House, 2019.

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.

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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)