SRINIVAS UNIVERSITY

Mukka, Mangaluru – 574146

Web : www.srinivasuniversity.ac.in

[In compliance of University Grants Commission (Minimum Standards and Procedures for Award of M.Phil./Ph.D. Degree) Regulations, 2016]
Effective from 2017

REVISED COURSE WORK SYLLABUS OF M . P H I L / PH. D. PROGRAMME IN COMPUTER SCIENCE / COMPUTER SCIENCE & ENGINEERING- FROM JANUARY 2020

COLLEGE OF COMPUTER SCIENCE & INFORMATION SCIENCE

City Campus, Pandeshwar,
Mangaluru – 575 001.

SRINIVAS UNIVERSITY

COLLEGE OF COMPUTER SCIENCE & INFORMATION SCIENCE

PH.D. PROGRAMME – JANUARY-2020

SYLLABUS OF COURSE WORK

A. COURSE WORK PATTERN 400 M

Sl. No.	Subjects	Exam (Hours)	Credits	Internal Marks	External Marks	Marks
1	Qualitative & Quantitative Research in CS & IS	2	4	50	50	100
2	Advanced Topics in CS & IS	2	4	50	50	100
3	Publication and Presentation of Industry Analysis (1 paper) Publication and Presentation of Company Analysis (1 paper)	2	4	50	50	100
4	Research and Publication Ethics and Research topic, Review of Literature (1 paper)	2	4 (2+2)	50	50	100
Total			**16**	**200**	**200**	**400**

B. COURSE WORK SYLLABUS

1. Qualitative & Quantitative Research Methods 100 M

Internal Marks: 50 **University Examination Marks: 50**

Unit 1: Research Methodology
Unit 2: Probability and Statistics
Unit 3: Scripting Languages
Unit 4: Technical writing using LaTeX
Unit 5: Research Methods & Techniques Online Certification:

Note : Submit hand written Assignment for Unit 1 to Unit 4 (4 Assignments). Submit Online Certificate obtained from NPTEL or Swayam.

Examination Pattern: Answer any 5 questions from 6, each carries 10 Marks. These questions should cover all four units.

2. Subject Paper: Advanced Topics in Computer Science and Information Science 100 M

Internal Marks : 50 **University Examination Marks : 50**

Unit 1: NoSQL Databases
Unit 2: Artificial Neural Networks
Unit 3: Cloud Computing
Unit 4: Data Science
Unit 5: Blockchain

Note : Prepare and submit Assignment in electronic format and also submit 250 MCQs Questions and answers (From each unit 50 Questions).

Examination Pattern: Answer all 50 questions, each carries 1 mark.

3. IT Case Studies **100 Marks**

Internal Marks: 50 **University Examination Marks: 50**

Publication and Presentation of Industry Analysis (1 paper) Publication and Presentation of Company Analysis (1 paper)

(1) Industry Analysis, Publication and Presentation - 1

(2) Company Analysis, Publication and Presentation – 2

Examination pattern: Answer any 5 Questions from 6, each carries 10 marks (3 Questions from Research and Publication Ethics and 3 Questions from Literature Review Article)

4. Research and Publication Ethics and Literature Review on Research Topic 100 Marks

Internal Marks: 50 **University Examination Marks: 50**

Research and Publication Ethics Syllabus (As per latest UGC norms)

Theory:

RPE 01: Philosophy and Ethics: Introduction to philosophy: definition, nature and scope, concept branches, Ethics: definition, moral philosophy, nature of moral judgements and reactions.

RPE 02: Scientific Conduct: Ethics with respect to science and research, intellectual honesty, and research integrity, Scientific misconducts: Falsification, Fabrication, and Plagiarism (PFP), Redundant Publications: duplicating and overlap publications, salami slicing, Selective reporting and misrepresentation of data

RPE 03: Publication Ethics: Publication ethics: definition, introduction and importance, Best Practices and standard setting initiatives and guidelines,: COPE, WAME etc., conflicts of interest, Publication misconduct: definition, concept, problems that lead to uetical behavior and vice versa, types, Violation of publication ethics, authorship and contributorship, Identification of publication misconduct, complaints and appeals, Predator Publishers and journals.

Practice:

RPE 04: Open Access Publishing: Open access publication and initiatives, Software tool to identify predatory publication developed by SPPU, Journal finder and journal suggestion tools,

RPE 05: Publication Misconduct: Group Discussion on Subject specific ethical issues, FFP authorship, Conflict of interest, Complaints and appeals: examples and fraud from India and abroad. Use of plagiarism software like urkund, Turnitin, Drillbit and other open source software tools.

RPE 06: Database and Research Metrics: Indexing databases, citation databases: Web of science, Scopus etc. Research Metrics: Impact factor of Journal Citation Report, SNIP, SJR, IPP, Cite Score, Metrics: h-index, g index, i10 index, altmetrics.

Literature Review on Research Topic

Topic Identification, preparing a Review Article on the identified topic with minimum 10 book reference, 50 research article reference, & 10 website reference. PPT Presentation & Publication of Review Article with research gap, and research agenda.

Examination pattern: Answer any 5 Questions from 6, each carries 10 marks (Guide will prepare 3 Questions from Research and Publication Ethics any 6 RPE sections without any conditions like it should cover all 6 RPE sections and 3 Questions from Literature Review Article).

Minimum for Pass required: 50% Marks in each individual subject.

Detailed Syllabus of Qualitative & Quantitative Research in CS & IS

UNIT I

Research Methodology: Introduction to Scientific Research, Meaning, Objectives and Significance of Research Motivation in Research, Types of research approaches, Quantitative research methods, Research methods versus methodology, Research process, Criteria of good research, Research problems, Necessity of defining the problem, Technique involved in defining the problem, Design and Development Research Methods, Meaning of research design, Need for

research design, Features of a good design, Different research designs, Basic principles of experimental designs, Ethics in research, Building expertise in the areas of interest, generating the base content in the selected area, literature survey for research work, arriving at directions of research, Formulation of research title, development of criteria based research proposal.

UNIT II

Probability and Statistics: Probability as a measure of uncertainty, probabilities for events, axioms, probability rules, Fail time data analysis, Hazard models, conditional probability, Bayes' rule, random variables, probability distributions, discrete and continuous distributions, univariate and multivariate distributions, joint, marginal, conditional distributions, expected values (mean, variance, covariance), sampling/simulation, study of a population or distribution, System reliability, Stochastic process, Software tools for Mathematical and statistical analysis, Scilab/SPSS.

UNIT III

Scripting Languages: Overview: The nature of scripting languages, scripting v/s programming, Python Programming. Regular expressions, Network programming, Internet client programming, Multithreaded programming, GUI programming, Database programming, Web clients and servers, Web programming: CGI and WSGI, Web frameworks : Django, web services.

UNIT IV

Technical writing using LaTeX: Scientific Writing : Significance of report writing, Structure and Components of Research Report, Types of Report: research papers, thesis, Research Project Reports, Precautions for writing research reports, Pictures and Graphs, Citation Styles, Oral presentation, Exposure to LaTeX, Installation, MikTeX, TeXnicCenter, Creating reports and articles, Text environment, Math environment, Figures, Tables, BibTeX - reference manager, Camera Ready Preparation. Statistics. Interpretation – Meaning, Technique, Precaution. Report Writing – Significance, Different Steps. Layout of the Research Report, Types of Reports, Oral Presentation, Research Report Writing – Mechanics, Precautions.

UNIT V

Online Certification Course based on research methodology from NPTEL, Swayam or any other online course providers.

REFECENCES:

1. C. R. Kothari, *Research Methodology Methods & Techniques*, 2nd Edition, Wishwa Pakashan Publishers.
2. Misra R.P, *Research Methodology – A Hand Book*, Concept publishing Company, New Delhi 1988
3.Kai Lai Chung, *A Course in Probability Theory*, Third Edition, Academic Press.
4. Gilbert Strang, *Introduction to Linear Algebra*, 3rd edition, Wellesley-Cambridge Press and SIAM
5. David Barron, *The World of Scripting Languages*, Wiley Publications.
6. Core Python application programming, Third edition Wesley J Chun, PEARSON.
7. Leslie Lamport, *LaTeX: A Document Preparation System*, Second Edition.

Detailed Syllabus of Advanced Topics in Computer Science and Information Science

Unit 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.

Unit 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.

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

Unit 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.

Unit 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.

****