# Pt. Ravishankar Shukla University, Raipur

Course work for Ph.D. in Computer Science

| Sr. No | Paper | Name of Papers |
|---|---|---|
| 1. | Paper-I | Research Methodology, Communication System and Parallel Computing |
| 2. | Paper-II | Review of Research Paper. |

# PAPER - I
# Research Methodology, Communication System and Parallel Computing

## Course Outcomes

After the completion of course, Student must be able

- To understand a general definition of research ethics and its design.
- To identify research problem stated in a study, the overall process of designing a research study from its inception to its report.
- To make the students aware about Communication system, its protocol and also about parallel Computing.
- To apprise the students of the concepts of Multiprocessors, Multicomputer, Pipelining etc.
- To open up new areas in the field of research and development in the area of networking and parallel computing.

## Syllabus

**Unit- I**

**Research Methodology and Measurement**– Introduction, meaning, motivation, approaches, research proposal, research ethics, research problem, research design, sampling design. Measurement in research, sources of errors, error calculation and handling with examples. Uncertainty analysis, Hypothesis, Performance Metrics and evaluation with example.

**Unit- II**

**Communication System-** Wired and Unwired Networks, Modulation and Multiplexing, OSI and TCP/IP Models, Switches and Switching, ATM, Network Security. Protocols like Aloha, S-Aloha etc. Header Formats. Interconnection Networks.

**Unit- III**

**Parallel Computing-** Types of Parallelism, Classification Schemes, Multiprocessor and Multicomputer, Memory Models and Organizations, Cache Coherence, Pipelining, MAL calculation, Hazard and Collision, Dependence Analysis, Data Flow and Vector Computers, DAG, Multi threading, Case Studies.

**Unit- IV**

**Study and Implementation of Algorithms-** Complexity, Routing and Congestion Control algorithms, Parallel Algorithms for sorting, matrix handling etc. Table Driven, Source Initiated on Demand and Hybrid Protocols, Code Optimization.

**Unit- V**

**Modelling and Simulation-** Introduction to Modelling, Queuing Analysis, Mathematical Modelling of Communication System, Monte-Carlo Simulation Technique, Simulation of Communication System through C Language, Study of different Simulators. Environment setup and Trace File generation in Network Simulator.

**Recommended books –**


1. System Simulation with Digital Computer by N.Deo, IIT Kanpur, PHI.
2. Computer Architecture & Parallel Processing by Kai Hwang and F.A. Briggs-Mc Graw Hill.
3. Research Methodology C.R. Kothari, New Age international Publishers
4. Advanced Computer Architecture By Kai Hwang –Mc Graw Hill.
5. Parallel Computing Theory and practice by Michael J. Quinn –Tata Mc-Graw Hill.
6. Computer Network by A.S. Tanenbaum, Pearson Education.
7. Data Communications and Networking by B.A. Forouzan, TMH.

# PAPER - II
# Review of Research Paper

## Course Outcomes

A substantial part of the research paper is the literature review, the importance of which is many. The literature review helps to

- identify variance in previous studies and progress over time and therefore establishes a foundation on which current research can be based.
- collect more information about the current research project.
- evaluate pertinent theoretical framework for the current research project.
- discover relevant research methodology i.e. methods and approaches that have been successful in similar studies; it also assists in the identification of survey instruments for which the psychometric properties have been established.
- validate current arguments based on previous experiential findings.
- differentiate your approach and arguments and demonstrates your thinking on the subject matter
- To find and justify the research gaps that we intend to work on.
- To justify the need of research in the area.
- To avoid plagiarism.