

# 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.

### Research Methodology, Communication System and Parallel Computing

#### 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 examples.

#### 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.

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