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.

(Dr. Sanjay Kumar) (Dr. V.K. Patle) (Dr. A.K. Tiwari) (Dr. Vibha Dubey) (Dr. Pooja Rathi)

(Mr. Mannu Rawani) (Miss. Vartika Shrivastav) (Dr.Pranjali Dewangan) (Mr. Samik Bhattacharya)

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.

(Dr. Sanjay Kumar) (Dr. V.K. Patle) (Dr. A.K. Tiwari) (Dr. Vibha Dubey) (Dr. Pooja Rathi)

(Mr. Mannu Rawani) (Miss. Vartika Shrivastav) (Dr.Pranjali Dewangan) (Mr. Samik Bhattacharya)

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.

Research and publication Ethics (RPE)

Course Title:

- **Research and publication Ethics (RPE)** - Course for awareness about the publication ethics and publication misconducts.

Course Level:

- 2 credit course (30 hrs.)

Eligibility:

- M.Phil, Ph.D. students and interested faculty members(it will be made available to post graduate students at later date)

Fees:

- As per university rules

Faculty:

- Interdisciplinary Studies

Qualification of faculty members of the course:

- Ph.D. in relevant subject areas having more than 10 years of teaching experience.

About the course

Course Code: CPE- RPE

Overview

- This course has total 6 units focusing on basics of philosophy of science and ethics, research integrity, publication ethics. Hands-on-session are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor, etc.) and plagiarism tool will be introduced in this course.

Pedagogy:

- Class room teaching, guest lectures, group discussion, and practical session.

Evaluation:

- Continuous assessment will be done through tutorials, assignments, quizzes, and group discussion. Weightage will be given for active participation. Final written examination will be conducted at the end of the course.

(Dr. Sanjay Kumar) (Dr. V.K. Patle) (Dr. A.K. Tiwari) (Dr. Vibha Dubey) (Dr. Pooja Rathi)

(Mr. Mannu Rawani) (Miss. Vartika Shrivastav) (Dr.Pranjal Dewangan) (Mr. Sanak Bhattacharya)

Course structure

- The course comprises of six modules listed in table below. Each module has 4 -5 units.

Modules	Unit title	Teaching hours
Theory		
RPE 01	Philosophy and Ethics	4
RPE 02	Scientific Conduct	4
RPE 03	Publication Ethics	7
Practice		
RPE 04	Open Access publishing	4
RPE 05	Publication Misconduct	4
RPE 06	Databases and Research metrics	7
	Total	**30**

Syllabus in detail

THEORY

- **RPE 01: PHILOSOPHY AND ETHICS (4 Hrs.)**
  1. Introduction to philosophy: definition, nature and scope, concept, branches.
  2. **Ethics:** definition, moral philosophy, nature of moral judgments and reactions.

- **RPE 02: SCIENTIFIC CONDUCT (4 Hrs.)**
  1. Ethics with respect to science and research
  2. Intellectual honesty and research integrity
  3. Scientific misconducts: Falsification, fabrication and plagiarism (FFP)
  4. Redundant publications: duplicate and overlapping publication, salami slicing
  5. Selective reporting and misrepresentation of data

- **RPE 03: PUBLICATION ETHICS (7 hrs.)**
  1. Publication ethics: definition, introduction and importance
  2. Best practice / standards setting initiatives and guidelines: COPE, WAME, etc.
  3. Conflicts of interest
  4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types.
  5. Violation of publication ethics, authorship and contributor ship
  6. Identification of publication misconduct, complaints and appeals
  7. Predatory publishers and journals

PRACTICE

- **RPE 04: OPEN ACCESS PUBLISHING (4 hrs.)**
  1. Open access publication and initiatives
  2. SHERPA/Romeo online resource to check publisher copyright & self-archiving policies.
  3. Software tool to identify predatory publications developed by sppu.
  4. Journal finder/ journal suggestion tools viz. JANE, Elsevier journal finder, Springer journal suggester, etc.

(Dr. Sanjay Kumar) (Dr. V.K. Patle) (Dr. A.K. Tiwari) (Dr. Vibha Dubey) (Dr. Pooja Rathi)

(Mr. Manu Rawani) (Miss. Vartika Shrivastav) (Dr.Pranjali Dewangan) (Mr. Samik Bhattacharya)

- **RPE 05: PUBLICAIONS MISCONDUCT (4 hrs.)**

A. Group Discussions (2 hrs.)

1. Subject specific ethical issues, FFP, authorship.
2. Conflicts of interest.
3. Complaints and appeals: examples and fraud from India and abroad.

B. Software tools (2 hrs.)

Use of plagiarism software like Turnitin, Urkund and other open source software tools.

- **RPE 06: DATABASES AND RESEARCH METRICS (7 hrs.)**

A. Databases (4 hrs.)

1. Indexing databases
2. Citation database: web of science, Scopus, etc.

B. Research Metrics (3 hrs.)

1. Impact factor of journal as per journal citation report, SNIP, SJR,IPP, Cite Score
2. Metrics: h-index, g index, i10 index, altmetrics.

References:

Bird, A.(2006). Philosophy of Science. Routledge.
MacIntyre, Alasdair(1967) A Short History of Ethics.London.
P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guid to Responsible Conduct in Research: Third Edition. National Academies Press.
Resnik, D. B. (2011). What is ethics in research & Why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm
Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://www.nature.com/articles/489179a
Indian National Science Academy(INSA), Ethics in Science Education, Research and Governance(2019), ISBN:978-81-939482-1-7. https://www.insaindia.res.in/pdf/Ethics_Book.pdf

(Dr. Sanjay Kumar) (Dr. V.K. Patle) (Dr. A.K. Tiwari) (Dr. Vibha Dubey) (Dr. Pooja Rathi)

(Mr. Mannu Rawani) (Miss. Vartika Shrivastav) (Dr.Pranjal Dewangan) (Mr. Samik Bhattacharya)