

**Department of Computer Science  
University of Lucknow, Lucknow.**

**Ph.D Course work Syllabus (with effect from the session 2015-2016 onward)**

Board of studies meeting was held on 11.02.2016 at 12:00 noon in the room of the Head, Department of Computer Science and following decisions have been taken:

Ph.D Course work syllabus is divided into two Papers; each paper will be for 100 Marks and will have two parts. Part-1 will be of theory examination and part-II will be of report and presentation. Part-I of each paper will consist of 4 units and two questions will be asked from each unit, student has to attempt one question from each unit. Passing marks will be 50 of each paper.

Examination will be conducted by Department of Computer Science.

**Paper-I-Computer science** **100 Marks**

**PART-1:** **60 Marks**

**Unit-I:**

Definition and types of Operating system, Operating System Services, System Programs, System Structure, System Design and Implementation, Generations of Computers and software Evaluations. System Analysis and Design. Construction and Testing, Implementation, Maintenance.

**Unit-II:**

Data Warehouse, Knowledge Discovery and Decision Making, Knowledge Discovery and Data Mining, application of Data Warehouse, AI technique, AI Applications, expert system, knowledge acquisitions, case studies of various AI tools.

**Unit-III:**

Data Communication and Computer Network, OSI Model, Network Quality and Reliability, Electromagnetic spectrum, Software engineering concepts, Software project planning, Software quality and Reliability.

**Unit-IV:**

Genetic algorithms, genetic operators-Reproduction, crossover and mutation, real life problems, fuzzy rule based systems, decision making through fuzzy and GA, fuzzy control system, neural network, associative memory, adapting resonance theory hybrid system.

**PART-II** **40 Marks**

Ph.D students should study minimum 5 papers for IEEE/ACM/Elsevier Journals only and getting approval of 5 research papers from Committee of the Department to submit the technical Report base on analysis of research papers, which shows the interest of candidate.

**Evaluation based on report and presentation:** **40 Marks**

**PART-1:****60 Marks****Unit-I:**

Definition of Research Problem: Necessity of defining problem, Technique involved in defining problem, Survey the available literature. Techniques involved in solving the problem: Different method used to solve a problem, Nature of research problem: theoretical research, experimental Research, case study.

**Unit-II:**

Research Design: Subject of study; Place of study; Reason of such study; Type of data required Method of data collection; Periods of study; Style of data presentation.

Developing a Research Plan: Research objective; Information's required for solving the problem Each major concept should be defined in operational terms; An overall decryption of approach should be given and assumption if considered should be clearly mentioned in research plan; The details of techniques to be adopted.

**Unit-III:**

Methods of data collection: Experimental Methods, Analysis of data: Various measures of relationship often used in research studies, Correlation coefficients, Chi-Square test: Definition of chi-square test, significance in Statistical analysis.

Research meaning, characteristics and types, Step of Research, Method of Research, Research Ethics, Research Paper, Thesis writing and its important components.

**Unit-IV:**

Using Computers in Research:

Basics of operating systems-handling different operating system; Literature survey using well-handling search engines; Computer usage for collecting/analyzing data-simulations using fortran / C / Mathematical / Matlab / Mathcad; Preparing presentations:

- i) Research Papers: Using word processing software-MS Word/Latex/Other, Drawing graphs and diagram-Origin/Xmgrace/Excel/others.
- ii) Seminar Presentation-Power point for oral and poster presentations.

**PART-1:****40 Marks**

Ph.D students should study various software/tools, which is required for research work in specific research area. Research student must use the tools for some research analysis and submit the research report on tools and applications in specific areas, which shows the interest of candidate in various tools of software.

**Evaluation based on report and presentation****40 Marks**