

**Tantia University**  
Sri Ganganagar  
Ph.D. Course Work Syllabus  
(Revised as Per UGC Regulation 2022)  
Computer Science

**Maximum Marks-120**

**Minimum Marks-66**

**PART-A**

**Part A- 60 Marks**

**Total Credits = 6**

**Total Hours=6x45= 270 Hours**

**Introduction to Research**

Introduction of Research, Research methodology, Defining Research problem and formulation of hypothesis, research design, sampling design, measuring and scaling techniques, methods of data collection.

Pure and Applied Research, Exploring or Formulative Research, Descriptive Research, Diagnostic Research/Study, Evaluation Research/Studies, Action Research, Experimental Research, Historical Research, Surveys, Case Study, Field Studies

Research Ethics: Characteristics and format of research paper, article, thesis writing, review of Related Literature, Purpose of the review, Identification of the related literature. Organizing the related literature.

**Statistics**

Concept of statistics, relevance in research, parametric and non-parametric data; graphical representation of data: histogram, frequency polygon, ogive and pie chart; Measures of Central Tendency, Correlation, t-test chi square test

**Computer Application**

Basic and fundamental knowledge of Computer and its Applications. Introduction, Application Area, Operating System, Windows, Office, Internet.

**PART-B**

**Part B- 60 Marks (Subject based)**

**Total Credits = 6**

**Total Hours=6x45= 270 Hours**

**1. Computer Architectural Framework:**

Introduction to Object Oriented Systems, Introduction to distributed Objects, Component Object Model (COM), interfaces in COM, Classes and Objects in COM/DCOM, Distributed COM, CORBA, JAVA, and Object Web.

2. **Computer System Design:**

Overview of Parallel Processing and Pipeline Processing, Principles of Scalable Performance, Pipeline Architecture, Vector and Array Processor, Multiprocessor Architecture, Multithreaded Architecture.

3. **Advanced Computer Algorithms:**

Introduction. Algorithm Analysis, Algorithm Design Techniques, Sorting and Searching Algorithms, String Processing Algorithms, Divide and Conquer Method, Greedy Method, Dynamic Programming, Back tracking, Branch and Bound, NP-hard and NP-complete problems

4. **Advanced Software Engineering:**

Software Development Process, Requirement Engineering, System Design Overview, Testing, Web Engineering, and Software Quality Metrics.

5. **Advanced Database Management Systems:**

Parallel and Distributed Databases, Web Databases, Data warehousing, Data mining, Object Database Systems, XML, Spatial Data management, Deductive databases, Advanced Transaction Processing.

6. **Wireless Networks and Communication: Introduction:**

Frequencies for Radio Transmission, Medium Access Control, Telecommunication Systems, Satellite Systems, Broadcast Systems, Wireless LAN, Wireless ATM, Mobile Network Layer, Mobile Transport Layer, Support Layer for Mobility, Performance Issues.

7. **Web Technologies:**

Web Environment, XML Primer, XLS, JSP.ASP, Web Technologies, the Web as an Example of Client Server Computing, Building Web Applications.

8. **Distributed Systems:**

Characterization of Distributed System, Interposes Communication, Distributed Objects and Remote Invocation, Operating System Support, Security, Distributed File System, Name Services, Time and Global States, Co-ordination and Agreements, Transaction and Concurrency Control, Replication, Distributed Shared Memory.