**SYLLABUS FOR THE SUBJECT OF COMPUTER SCIENCE**

**PAPER- I**

**Total Marks: 100**

**SECTION-A**

1. **Introduction to Computing**

Number Systems, Binary numbers, Boolean logic, History Computer system,

basic machine organization, Von Neumann Architecture, Algorithm definition,

design, and implementation, Programming paradigms and Languages, Graphical

programming, Overview of Software Engineering and Information Technology,

Operating system, Compiler, Computer networks and Internet, Computer

graphics, Al, Social and legal issues.

2. **Programming Solving Techniques**

Algorithms and problem solving, development of basic Algorithms, analyzing

problem, designing solution, testing designed solution, fundamental programming

constructs, translation of algorithms to programmes, data types, control

structures, functions, arrays, records, files, testing programmes.

**REFERENCE MATERIAL:**

*1. Computers: Information Technology in Perspective, 9/e by Larry Long and*

*Nancy Long. Prentice Hall, 2002/ISBN: 0130929891*

*2. An Invitation to Computer Science, Schneider and Gersting, Brooks/Cole*

*Thomson Learning, 2000*

*3. Computer Science: An overview of Computer Science, Sherer*

*4. Programme Design with Pseudo-code, Bailey and Lundgaard, Brooks/Cole*

*Publishing, 1988*

*5. Simple Programme Design: A step-by-step approach, 4/e, Lesley Anne*

*Robertson, ISBN: o-619-16046-2 © 2004.*

**SECTION-B**

1. **Computer Communications & Networks**

Analogue and digital Transmission, Noise, Media, Encoding, Asynchronous and

Synchronous transmission, Protocol design issues, Network System architecture

(OSI, TCP/IP), Error control, Flow Control, Data Link Protocols (HDLC,PPP).

Local Area Networks and MAC Layer protocols (Ethernet, Token ring),

Multiplexing, Switching and IP Networks, Internetworking, Routing, Bridging,

Transport layer protocols TCP/IP, UDP. Network security issues, Programming

exercises or projects involving implementation of protocols at different layers.

2. **Digital Logic & Computer Architecture**

Logic design of Digital Systems, Fundamental and advanced concepts of Logic

Designs, Boolean Algebra & functions, Designing and implementation of

combinational and Sequential logic, minimization techniques, number

representation and basic binary arithmetic Logic families and digital integrated

circuits, use of CAD tools for logic designs. Topics of Computer Architecture.

**REFERENCE MATERIAL:**

*1. Introduction to Computer Networks, Tanenbaum*

*2. Unix Network Programming, Richard Stevens.*

*3. Computer networks: a systems approach, Larry Peterson, Bruce Davie,*

*Princeton Univ., Princeton.*

4. *Digital Design, 2nd Ed., M. Morris Mano, Prentice hall, 1991.*

*5. Practical Digital Logic Design and Testing, P. K Lala, Prentice Hall, 1996.*

**SECTION-C**

**1. Data Structures & Algorithms**

Basic database concepts; Entity Relationship modeling, Relational data model

and algebra, Structured Query Language, RDBMS, Database design, functional

dependencies and normal forms, Transaction processing and optimization

concepts, concurrency control and recovery techniques, Database recovery

techniques, Database security and authorization, Small Group Project

implementing a database, Physical database design. Storage and file structure,

indexed files, hashed files, signature files, b-trees, files with dense index, file with

variable length records, database efficiency and tuning.

2. **Operating Systems**

History and Goals, Evolution of multi-user systems, Process and CPU

management, Multithreding, Kernel and User Modes, Protection, Problems of

cooperative processes, Synchronization, Deadlocks, Memory management and

virtual memory, Relocation, External Fragmentation, Paging and Demand

Paging, Secondary storage, Security and Protection, File systems, I/O systems,

Introduction to distributed operating systems. Scheduling, dispatch and

Introduction to concurrency.

**REFERENCE MATERIAL:**

*1. Database Systems, C.J.Date, Addison Wesley Pub. Co. ( 2004).*

*2. Database Systems, A Practical Approach to Design, Implementation and*

*Management. R. Connoly and P. Begg, Addision \_Wesley Pub. (2003).*

*3. Fundamentals of Database systems, 3/E, Elmasri and Navathe, Addision-*

*Wesley, ISBN: 0-201-74153-9*

4. *Applied Operating Systems Concepts, 6th Edition, Silberschatz A., Peterson,*

*J.L., & Galvin P.C. 1998.*

5. *Modern Operating Systems, 2nd Edition, Tanenmaum A.S., 2001.*