

University Department of Computer Applications

Vinoba Bhave University, Hazaribag

Ph.D. DEET Syllabus (Computer Science) – 2017

Information Technology: introduction, Characteristics of Computer, Evolution of Computers, Generations of Computers, Classification of Computers, Primary Memory, Secondary Memory and Operating System, internet basics: introduction, Evolution of internet, basic internet terms, getting connected to internet applications

Programming language concepts and paradigms: Data types, operators, expressions assignment. Flow of control, control structures, I/O statements, User defined and built in function, Parameter passing.

Language Design: Syntax and semantics of programming language and related concepts programming paradigm and related concepts: imperative object oriented.

Computer Architecture: Representation of numbers; octal, hexadecimal and binary 2's complement and 1's complement, floating point representation. Combinational circuit design, sequential circuit design, hardware and microprogrammed processor design, instruction formats, addressing modes, memory types and organization, interfacing peripheral devices, interrupts.

Data Structures: basic data structures, arrays, stacks, queues, and their applications, linked lists, trees, graphs – implementation and application, sorting searching hashing techniques.

Algorithm Design: Performance Analysis, Algorithm Paradigms: Divide & Conquer method greedy approach, Dynamic programming & Backtracking.

Operating System: File systems, CPU scheduling, memory management, virtual memory, Disk scheduling, deadlocks, process synchronization.

Database: ER diagrams, data models, design of relational database, normalization, 1NF, 2NF, 3NF, BCNF & 4 NF. Limitation of normal forms SQL, Query languages transaction and concurrency control.

Computer Networks and Security OSI and TCP/IP Architecture, flow and error control, Routing Algorithms, TCP and UDP, Socket application layer protocols, SMTP, HTTP, DNS, WWW, Security symmetric Asymmetric Key Cryptography.

Software Engineering; software development life cycle, software requirement, specification, system design, coding, testing, software project management.