COURSE STRUCTURE & SYLLABUS OF
BACHELOR OF TECHNOLOGY (B.TECH)

In

COMPUTER SCIENCE

Course Structure

Third Year

Sixth Semester

Paper Code	Subject
BTCO6	Computer Network
BTCO7	Theory of Computation
BTCO8	Micro- processor
BTCO9	Principles of Programming
BTCO10	Industrial Economics & Management

BTCO6 : COMPUTER NETWORK

Chapter 1: Communication Networks and Services
Network functions and network topology, basics of message switching and cell switching.

Chapter 2: Application and Layered Architectures
Layering architecture, the OSI reference model, unified view of layers, protocols and overview of TCP/IP architecture, TCP/IP protocol.

Chapter 3: Telephone Network
Frequency division and time division multiplexing, synchronous optical network (SONET), SONET multiplexing, space division and time division circuit switches, Telephone integrated services digital network, network channel signaling and routing control.

Chapter 4: Peer-to-Peer Protocols
Peer-to-Peer protocols and service models, service models, end to end requirement adaptation functions, end-to-end versus hop by hop. ARO protocols, stop and wait back-N ARQ, selective repeat ARQ, transmission efficiency of ARQ protocols, sliding flow control, timing recovery for synchronous services, reliable stream service, data controls, HDLC data link control, point protocol, statistical multiplexing.

Chapter 5: Local Area Network
Multiple access communications, local area networks (LAN) structure, the medium control sub layer, random access, ALOHA, slotted ALOHA, CSMA/CD, scheduling approaches to medium access control, reservation systems, token passing rings, comparison of random access and scheduling medium access, IEEE 802.3 standards for 10 Mbps and 1000 Mbps LAN's, repeaters and hubs, LAN transparent bridges, source routing, link state versus distance vector routing, shortest path algorithms, the Bellman-Ford algorithm, Dijkstra's algorithm, other routing approaches.

Chapter 6: Packet Switching Networks
Network services and internal network operation, packet network topology, connectionless packet switching, virtual circuit packet switching, routing in packet networks, routing algorithm classification, routing tables, hierarchical routing, link state versus distance vector routing, shortest path algorithms, the Bellman-Ford algorithm, Dijkstra's algorithm, other routing approaches.

Chapter 7: Frame Relay and Asynchronous Mode (ATM)
Frame relay protocol architecture, frame relay call control, user data transfer network function congestion control, ATM architecture, logical connection, ATM cells, transmission of ATM cells, ATM adaptation layers, ATM traffic management and QoS, FIFO and priority queues, congestion control, open loop control, closed loop control.

Chapter 8: TCP/IP
The Internet Protocol (IP), IP packet, IP addressing, subnet mask, classless interdomain routing (CIDR), address resolution, reverse address resolution, IP fragmentation and reassembly, ICMP, User Data gram Protocol (UDR), Transmission Control Protocol (TCP), TCP reliable stream services, TCP operation, TCP protocol, Dynamic Host Configuration Protocol (DHCP), mobile IP, IPv6, Internet routing protocols, routing information protocols, open shortest path first protocol, border gateway protocol, multicast routing, reverse path broadcasting, internet group management protocol, reverse path multicasting, distance vector multicast routing protocol.

BTCO7 : THEORY OF COMPUTATION

Chapter 1: Introduction Sets.

Chapter 2: Relations and Languages:
Sets, Relations and functions, Special types of binary relations, Finite and infinite sets, Three fundamental proof techniques, Closures and algorithms, Alphabets and languages, Finite representations of languages.

Chapter 3: Finite Automat:
Deterministic finite automata, Nondeterministic finite automata, Finite automata and regular expressions, Languages that are and are not regular, State minimization, Algorithmic aspects of finite automata.

Chapter 4: Context-Free Languages:
Context – Free grammars, Parse trees, Pushdown automata, Pushdown automata and context-free grammars, Languages that are and are not context – free, Algorithms for context-free grammars, Determinism and parsing,

Chapter 5: Turning machines:
The definitions of a turning machine, Computing with Turing machines, Computing with turning machines, Extensions of turning machines, Random access turning machines, Nondeterministic turning machines, Grammars, Numerical Functions.

Chapter 6: Undecidability:
The church – Turning thesis, Universal Turing machines, The halting problem, Unsolvable problems about turning machines, unsolvable problems about grammars, An unsolvable tiling problem , Properties of recursive languages.

Chapter 7: Computational Complexity:
The class, Problems, problems …… , Boolean Satisfiability , The Class NP.

Chapter 8: NP-Completeness: Polynomial –time reductions, Cook's Theorem, More NP-complete problems, Coping with NP-completeness.

BTCO8 : MICRO- PROCESSOR

Chapter 1: Microprocessor Architecture and Microcomputer Systems:
Microprocessor Architecture and Its Operations, Memory, Input and output(I/O) Devices, Example of a Microcomputer System, Review Long Devices for Interfacing.

Chapter 2: 8086 Microprocessor Architecture and Memory Interfacing :
The 8085 MPU, Example of an 8085-Based Microcomputer, Memory Interfacing, The SDK-85 Memory System, How Does an 8085-Based Single-Board Microcomputer Work?
Chapter 3: Interfacing I/O Devices:
Basic Interfacing Concepts, Interfacing Output displays, Interfacing Input Devices, Memory-Mapped I/O, Testing and Troubleshooting I/O Interfacing Circuits.

Chapter 4: Interrupts:
objectives, the 8085 interrupt, rst (restart) instructions, problem statement, main program, description of the interrupt process, testing interrupt on a single-board computer system, issues in implementing interrupts, 8085 vectored interrupts, trap, rst 7.5, 6.5, and 5.5, triggering levels, pending interrupts, problem statement, hardware description, monitor programe, main program, program description, internet service routine, restart as software instructions, problem statement, problem analysis, breakpoint subroutine, program discription, additional i/o concepts and processes, 8259a interrupt operation.
Chapter 5: Interfacing Data Converters:
Objective, digital-to-analog (d/a) converters, r/2r ladder network, problem statement, hardware description, program, operating the d/a converter in a bipolar range, hardware description, analog-to-digital (aid) converters, interfacing an 8-bit a/d converter using status check, hardware description, interfacing circuit, service routine, dual-slope a/d converters.

Chapter 6: SDK-85 Programmable Interface Devices:
Objective, basic concepts in programmable devices, data input with handshake, data output with handshake, the 8155/8156 and 8355/8755 multipurpose programmable devices, control logic, the 8155 i/o ports, chip enable logic and port addresses, control word, hardware description, control word, program description, problem statement, control signals in handshake mode, input, output, status word, problem statement, problem analysis, port addresses, program description, interrupt i/o, the 8279 programmable keyboard/displa y interface, keyboard section, scan section, display section, mpu interface section, circuit description, decoding logic and port addresses, initialization instructions.

Chapter 7: General-Purpose Programmable peripheral Devices:
Objective, the 8255a programmable peripheral interface, control logic, bsr control word, port address, subroutine, problem statement, problem analysis, mode 0: control word, bsr control word for start pulse, subroutine, program description, mode 1: input control signals, control and status words, programming the 8255a in mode 1, mode 1: output control signals, control and status words, problem statement, program description, illustration: interfacing keyboard and seven-segment display, key debounce, illustration : bidirectional data transfer between two microcomputers, data transfer from master mpu to slave mpu, data transfer from slave to master mpu, control word-mode 2, status word-mode 2, read and write operations of the slave mpu, program comments, slave program, The 8254 (8253) Programmable Interval Timer, Data Bus Buffer, Control Logic, Mode, Write Operations, Read Operations, Problem Statement, Mode 0: Interrupt On Terminal Count, Mode 1: Hardw Are-Retriggerable One-Shot, Mode 2: Rate Generator, Mode 3: Square-Wave Generator, Mode 4: Software-Triggered Strobe, Mode 5: Hardware-Triggered Strobe, Read-Back Command, The 8259a Programmable Interrupt Controller, Read/Write Logic, Control Logic, Interrupt Registers And Priority Resolver, Cascade Buffer/Comparator, End Of Interrupt, Additional Pea Tures Of The 8259a, Direct Memory Access (Dma) And The 8257 Dma Controller, Dma.Channels, Need For 8212 And Signal Adstb, Signal Aen (Address Enable), Initialization, Dma Execution.

Chapter 9: Serial I/O and Data Communication:
Objectives, Designing scanned displays, Sn 75491-segment driver, Sn 75492-digit driver, Interfacing a matrix keyboard, Keyboard subroutine, Mm74c923 keyboard encoder, Memory design, Eprom memory,

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B.Tech (VI sem) computer

Wait state calculations, 8086 mpu design, Address bus, Data bus, Control signals, Frequency and power requirements, Externally triggered signals, Designing a system: single-board microcomputer, Keyboard, Display, Execute, System buses and their driving capacity, Keyboard and displays, Software design, Program coding, Development and troubleshooting tools, Emulation process, Features of in-circuit emulator, Debugging tools.

Chapter 10: Introduction To 8085 Assembly Language Programming
Objectives, the 8085 programming model, registers, accumulator, flags, program counter (pc), stack pointer (sp), instruction classification, data transfer (copy) operations, arithmetic operations, logical operations, branching operations, machine control operations, instruction format, one-byte instructions, two-byte instructions, three-byte instructions.

BTCO9 : PRINCIPLES OF PROGRAMMING

1.   LANGUAGES DESIGN ISSUES
Why Study Programming Languages?, A Short History of Programming Languages – Development of Early Languages; Evolution of Software Architectures; Application Domains, Role of Programming Languages – What makes a Good Languages?; Language Paradigms; Language Standardization; Internationalization, Programming Environments – Effects on Language Design; Environment Frameworks; Job Control and Process Languages, C Overview, Suggestions for Further Reading.

2.   IMPACT OF MACHINE ARCHITECTURES
Virtual Computers and Language Implementations, Hierarchies of Virtual Machines, Binding and Binding Time, Java Overview.

3.   ELEMENTARY DATA TYPES
Data Objects; Variables; and Constants, Data types, Declarations, Type Checking and Type Conversion, Assignment and Initialization, Numerical Data Types , Enumerations, Booleans, Characters, Character Strings, Pointers and Programmer-Constructed Data Objects, Files and Input-Output.

4.   ENCAPSULATION
Structured Data Objects and Data Types, Specification of Data Structure Types, Implementation of Data Structure Types, Declaration and Type Checking for Data Structures, Vectors and Arrays, Records, Lists, Sets, Executable Data Objects, Evolution of the Data Type Concept, Information Hiding, Subprograms as Abstract Operations, Subprogram Definition and Invocation, Subprogram Definitions as Data Objects.

5.   INHERITANCE
Abstract Data Types Revisited, Derived Classes, Methods, Abstract Classes, Smalltalk Overview, Objects and Messages, Abstraction Concepts, Polymorphism.

6.   SEQUENCE CONTROL
Implicit and Explicit Sequence Control, Sequencing with Arithmetic Expressions – Tree-Structure Representation; Execution-Time Representation, Sequence Control Between Statements – Basic Statements; Structured Sequence Control; Prime Programs.

7.   SUBPROGRAM CONTROL
Simple Call-Return Subprograms, Recursive Subprograms, The Pascal Forward Declaration, Names and Referencing Environments, Static and Dynamic Scope, Block Structure, Local Data and Local Referencing Environments, Actual and Formal Parameters, Methods for Transmitting Parameters, Transmission Semantics, Implementation of Parameter Transmission.

BTCO 10: INDUSTRIAL ECONOMICS AND MANAGEMENT

Chapter 1 : Nature and Significance of Economics : Science, Engineering and Technology and their relationship with economics development, appropriate technology for development countries

Chapter 2 : Demand and Supply Analysis : Elasticity, Competition, Monopoly, Oligopoly, Monopolistic competition, Price Discrimination, Equilibrium of firm .

Chapter 3 : Function of Money : Supply and Demand for money, Inflation, Black Money.

Chapter 4: Functions of Commercial Bank : Multiple credit creation, Banking systems in India.

Chapter 5 : Central Banking : Functions of Central Banking, monetary policy.

Chapter 6: Sources of Public Revenue : Principles of taxation, Direct and Indirect taxes , reform of tax system .

Chapter 7: Theory of International Trade : Balance of trade and payment, Theory of protection, Exchange control, Devaluation.

Chapter 8: New Economics Policy : Liberalization, Extending , Privatization, Globalization, Market-Friendly state, Export led growth.

Chapter 9: Causes of Underdevelopment : Determinants of economic development, stages of economics growth, Strategy of development, Critical minimum effort strategy .

Chapter 10: Management Functions : Developments of management thought, Contribution of F.W. Taylor, Henri Fayol, Elton-Mayo, System Approach to Management .

Chapter 11: Nature of Planning : Decision making process, MBO.

Chapter 12: Organization : Line and Staff relationships, Decentralization of delegation of authority .

Chapter 13: Communication Process : Media Channels and barriers to effective communication .

Chapter 14: Theory of Motivation : Maslow, Herzberg and McGregor Theory of motivation, McClelland's achievement theory.

Chapter 15 : Production Management : Production Planning and control, inventory control, quality control, total quality management.

Chapter 16 : Project Management : Project Development life cycle, project feasibility, CPM, PERT.

Chapter 17: Cost Accounting and Finance : Techniques of Financial Control, Financial Statements Financial Ratios, Break-even analysis, Budgeting and budgetary control.
Chapter 18 : Marketing Functions : Management of Sales and advertising, Marketing research .

Chapter 19: Human Resource Management : Functions, Selection, Training.

Chapter 20 : Engineering Economics : Investment Decisions, Payback time .

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