

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

In

ELECTRICAL

Course Structure

Third Year

Sixth Semester

Paper Code	Subject
BTE6	Power Electronics & Devices
BTE7	Digital Signal Processing
BTE8	Micro - Processor
BTE9	Advance Power System & Design
BTE10	Industrial Economics & Management

BTE 6 : POWER ELECTRONICS AND DEVICES

Chapter 1 : POWER SEMICONDUCTOR DEVICE : Introduction, Thyristorised Power Controllers, Classification Of Power Controllers, Characteristics And Specification Of Power Devices, Comparison Of Power Devices

Chapter 2 : THYRISTOR : Introduction, Modes Of Operation, Dynamic Characteristics, Thyristors Gate Characteristics, Rating And Protection, Firing Circuits, Other Thyristors

Chapter 3 : TURN – OFF METHOD : Introduction, Natural Commutation (Class F : Line Commutation), Forced Commutation, Self Commutation By Resonating Load (Class A), Impulse Commutation (Class D : Auxiliary Voltage Commutation), Complementary Commutation (Class C), External Pulse Commutation (Class E)

Chapter 4 : CONTROLLED RECTIFIERS : Introduction, Principle Of Phase Controlled Converter Operation, Single Phase Semi Converters (Half Bridge Converter), Single Phase Full Converters, Three Phase Half Wave Converters, Three Phase Semiconverters, Three Phase Full Converters

Chapter 5 : INVERTERS : Introduction , Principle, Performance Parameters, Single Phase Bridge Inverter, Voltage Control Of Single Phase Inverters, Harmonic Reduction, Current Source Inverters

Chapter 6 : CHOPPERS : Introduction, Principle Of Step Down Operation, Step Down Chopper With RL Load, Principle Of Step Up Operation, Performance Parameters, Chopper Classification, Effects Of Source And Load Inductance, Applications Of Choppers

Chapter 7 : AC VOLTAGE CONTROLLER : Introduction, Principle Of On – Off Control, Principle Of Phase Control, Single Phase Controller With Resistive Loads (Bidirectional Controllers), Single Phase Controllers With Inductive Loads, Merits, Demerits And Applications Of Ac Voltage Controllers

BTE7 : DIGITAL SIGNAL PROCESSING

Chapter 1 : Introduction : Signal, Systems, and Signal Processing, Classification of Signals, The concept of frequency in continuous–time and discrete–time signals.

Chapter 2 : Discrete-Time Signals and Systems : Discrete-time signals , Analysis of discrete – Time linear time – Invariant systems, Discrete – Time systems described by Difference equations.

Chapter 3 : The Z-Transform and its application to the analysis of LTI Systems : The z-Transform , Properties of the z-Transform, Inversion of the z-Transform, The one-sided z-Transform.

Chapter 4 : Frequency Analysis of signals and systems : Frequency analysis of continuous –time signals , Frequency analysis of discrete-time signals, Properties of the fourier Transform for Discrete-Time signals.

Chapter 5 : The discrete fourier transform : Its properties and applications, Frequency domain sampling The discrete fourier transform, Properties of the DFT,

Chapter 6 : Sampling And Reconstruction Of Signals : Introduction, Representation Of A Continuous-Time Signal By Its Samples: The Sampling Theorem, Sampling With A Zero-Order Hold, Sampling Of Bandpass Signals, Discrete-Time Processing Of Continuous-Time Signals

BTE8 : MICRO- PROCESSOR

1. MICROPROCESSOR ARCHITECTURE AND MICROCOMPUTER SYSTEM

Objectives, the microprocessor is a programmable logic device, designed with registers, flip-flops, and timing elements, memory, r/wm (read/write memory), rom (read-only memory), ee-prom (electrically erasable prom), recent advances in memory technology, input and output (i/o) devices, example of a microcomputer system, review: logic devices for interfacing, examples of latches.

2. 8086 MICROPROCESSOR ARCHITECTURE AND MEMORY INTER-FACING

Objectives, the 8085 mpu, address bus, multiplexed address/data bus, control and status signals, power supply and clock frequency, externally initiated signals, serial i/o ports, the alu, timing and control unit, instruction register and decoder, register array, example of an 8085-based microcomputer, memory interfacing, the 8085 memory system, how does an 8085-based single-board microcomputer work?

3. INTERFACING I/O DEVICES

Objectives, basic interfacing concepts, out instruction (8085), in instruction, interfacing output displays, circuit analysis, program, program description, problem statement, hardware description, seven-segment led, interfacing circuit and its analysis, interfacing input devices, memory-mapped i/o, execution of memory-related data transfer instructions, output port and its address, input port and its address, testing and troubleshooting i/o interfacing circuits, some questions and answers.

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 program, main program, program description, internet service routine, restart as software instructions, problem statement, problem analysis, breakpoint subroutine, program description, additional i/o concepts and processes, 8259a interrupt operation.

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 (a/d) converters, interfacing an 8-bit a/d converter using status check, hardware description, interfacing circuit, service routine, dual-slope a/d converters.

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/display interface, keyboard section, scan section, display section, mpu interface section, circuit description, decoding logic and port addresses, initialization instructions.

7. GENERAL-PURPOSE PROGRAMMABLE PERIPHERAL DEVICE

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: Hardware-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 Features 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.

8. SERIAL I/O AND DATA COMMUNICATION

Objectives, Basic concepts in serial i/o, Synchronous vs, Asynchronous transmission, Simplex and duplex transmission, Rate of transmission (baud), Parity check, Checksum, Cyclic redundancy check (crc), Software-controlled asynchronous serial i/o, Serial output data (sod), Serial input data (sid), Hardware-controlled serial i/o using programmable chips, Read/write control logic and registers, Transmitter section, Receiver section, Initializing the 8251a, Program description.

9. MICROPROCESSOR APPLICATION

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, 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.

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.

BTE9 : ADVANCE POWER SYSTEM & DESIGN

Chapter 1 : Introduction : A Perspective, Structure of power systems, Conventional Sources of Electric Energy, Renewable Energy Sources, Energy Storage, Growth of Power Systems in India.

Chapter 2 : Representation of power System : Introduction, Single-phase Solution of Balan Three-phase Networks, One Line Diagram and Impeded Reactance Diagram, Per unit (PU) System, Complex Power, Synchronous Machine.

Chapter 3 : Representation of Loads, Load Flow Studies : Introduction, Y'bus by singular Transformation, Load flow problem, Gauss-seidel Method, Optimal system Operation, Automatic Generality voltage Control, Symmetrical F2 Analysis.

Chapter 4 : Symmetrical Components : Introduction, Symmetrical Component Transformation, Phase Shift in star-Delta Transformers, Sequence Impedances of transmission Lines, Sequence Impedances and Sequence Network of power System, Sequence Impedances and Networks of Synchronous Machine, Sequence Impedances of Transmission Lines, Sequence Impedances of Transmission Lines, Sequence Impedances and Networks of Transformers, Construction of sequence Networks of a power System.

Chapter 5 : Unsymmetrical Fault Analysis : Introduction, Symmetrical Component analysis of Unsymmetrical Faults, Single Line-To-Ground (LG) Fault, Line-To-Line (LL) Fault, Double Line-To-Ground (LLG) Fault, Open Conductor Faults, Bus Impedance Matrix Method For Analysis of Unsymmetrical Shunt Faults.

Chapter 6 : Power System Stability : Introduction, Dynamics of a Synchronous Machine, Power Angle Equation, Node Elimination Technique, Simple Systems, Numerical Solution of swing Equation, Multimachine Stability, some Factors Affecting Transient Stability.

Chapter 7 : Power System Security : Introduction, System State Classification, Security Analysis, Contingency Analysis, Sensitivity Factors, Power System Voltage Stability.

BTE 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 .
