

Mahavir Mahavidyalaya, Kolhapur

Department of Computer Science

Teaching Plan 2025-26

B.Sc Computer Science (Entire)- I

Course Title: Electronics Circuit Elements (Sem I) (Paper I)

Teacher: Miss. S. D. Patil

Month	Theory	Practicals
July	Admission process	
August	Unit I A) Semiconductors Diode: Types of diodes, Symbols, Forward & reverse biasing of a diode, Zener diode. Semiconductors, intrinsic semiconductor, extrinsic semiconductor. Construction of PN junction diode, formation of depletion layer. B) Bipolar Junction Transistor: Types of Transistors, Symbols, Construction details & working of NPN & PNP transistors, Operating modes of transistor, Applications: Transistor as an Amplifier.	1) Study of various Electronic components, equipment & measuring devices. 2) Measurement of Amplitude, Frequency & Phase of waveforms by using CRO. 3) Analyze the operation of transistor Working as a electronic Switch (Use Led and relay in the circuit.)
September	UNIT II A) BJT Amplifiers & Oscillators: Classification of Amplifiers (based on frequency range, Q point, coupling & stages) class-A, class-B, class-C & class-AB amplifiers, Concept of positive and negative feedback (only equations, no mathematical analysis).	4) Demonstrate Op-Amp Adder by using IC741. 5) Demonstrate Op-Amp Subtractor by using IC741.

	Oscillators : RC-phase shift, LC type: Colpitt's oscillator, Hartley's oscillator, Applications of Amplifiers and Oscillators.	
October	B) Operational Amplifier: Definition of Operational Amplifier, Concept of Differential amplifier, Internal block diagram of Op-Amp IC-741 , Symbol & Pin diagram of IC-741, Configurations of Op-Amp: Open-Loop & Closed Loop. Linear & Nonlinear applications of Op-Amp: Inverting mode amplifier, Virtual ground, Non-inverting amplifier, Unity gain amplifier, Op-Amp Adder, Op-Amp-Subtractor, Op-Amp Comparators, IC-555: Pin diagram & internal block diagram of IC-555.	6) Demonstrate Monostable multivibrator by using Timer IC-555. 7) Demonstrate Astable multivibrator by using Timer IC-555.
November	Exam Related Work	

Course Title: Digital Systems – I (Sem I) (PAPER II)

Month	Theory	Practical
July	Admission process	
August	UNIT I: A) Number System & Computer Codes Introduction and definition, Classification (Positional & Non – Positional), Positional Number System – Binary Number System, Decimal Number System, Octal Number System, Hexadecimal Number System, Conversion from one base to another base, 1's & 2's complement of binary numbers.	1) Implementation of Logic gates. 2) Implementation of Universal building block (NAND & NOR). 3) Demonstrate the Half Adder.

	B) Computer Codes: Introduction and definition, BCD, ASCII & Gray Code.	
September	UNIT II : A) Logic Gates : Definition, AND, OR, NOT, NOR, NAND, EX-OR (Symbol, Expression and Truth Table), Universal Gate ,Boolean algebra and identities, De Morgan's theorem and Inter conversion of logic Gates (NAND and NOR) .	4) Demonstrate the Full Adder. 5)Implementation of Half Subtractor. 6)Implementation of Full Subtractor
October	B)Combinational Circuits : Introduction,Half adder, Full adder, Half & Full Subtractor, Multiplexer and Demultiplexer .	7)Implementation of multiplexer and demultiplexer. 8)Implementation of De-Morgan's Theorems.
November	Exam Related Work	

Course Title: Electronics Circuit Elements (Sem II) (Paper III)

Month	Theory	Practical
December	Unit I : A) Sensors & Transducers: Definition of Transducers & Sensors, Classification of transducers & Sensors, Characteristics of Transducers, Specifications of Transducers (Accuracy, Range, Linearity, Sensitivity, Resolution, Reproducibility), Temperature Sensor : Thermocouple, RTD, LM35. B) Signal Conditioning & Data Convertors: Introduction, Signal conditioning of passive sensors using Wheatstone's bridge.	1)Study (R-2R Ladder) Using DAC.

	Filters: Concept, Active filters, Passive Filters (Low Pass, high pass) .	
January	<p>Digital Signal conditioning: Types of ADC, Flash-ADC, Specifications of ADC (Linearity, Resolution, Conversion time, Accuracy), Types of DAC : weighted resistors, R-2R Ladder DAC.</p> <p>UNIT II: A)Actuators & Data Acquisition Systems: Definition of Actuators, Types of Actuators, Electrical Actuators : Relays, Motors: AC, DC, Servo, Stepper. Data Acquisition Systems: Generalized DAS system, Signal conditioning for DAS, Types of DAS systems.</p>	2)Study of Asynchronous UP Or Down counter.
February	<p>C) Digital Instruments & Display devices: Digital Multimeter, Digital Frequency Meter, Concept of Digital Storage Oscilloscope, Digital Displays : LCD, LED.</p>	3)Study of Universal Shift Register.
March	Practical Exam Related Work	
April	Theory Exam Related Work	

Course Title: : Digital Systems - II(Sem II) (Paper IV)

Month	Theory	Practical
December	<p>Unit I : Sequential Circuits: A)Concept of sequential circuits : Types of Flip-flops: RS, Clocked RS, Latch, D (edge triggered), JK, Master-Slave JK.</p> <p>B)Counter :</p>	1)Execute the program of 1's Complement of 8 bit number using 8085 microprocessor.

	<p>Types of counters, concept of synchronous counters, asynchronous counters, 4-bit Ripple counter, Shift Register.</p>	<p>2) Execute the program of 1's Complement of 16 bit number using 8085 microprocessor.</p> <p>3) Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor</p> <p>4)Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor.</p>
<p>January</p>	<p>UNIT II : A)Memory Organization : Introduction, Characteristics of memory systems, Memory hierarchy, Cache memory, Memory mapping techniques, Virtual Memory, Memory management concepts (paging and Segmentation).</p>	<p>5) Execute the program of Addition of two 8 bit data using 8085 microprocessor.</p> <p>6) Execute the program Addition of two 16 bit data using 8085 microprocessor using 8085 microprocessor.</p> <p>7) Execute the program of Subtraction of two 8 bit data using 8085 microprocessor.</p> <p>8) Execute the program of Subtraction of two 16 bit data</p>

		using 8085 microprocessor
February	<p>B)Introduction to Microprocessors : General block diagram, Introduction & evolution of Microprocessors (4, 8, 16, 32..... Bits), Features, Pin Diagram and Architecture of 8085, Instruction Set of 8085 & Programming - Instruction format, addressing modes, ALP 's for Data transfer, Addition, Subtraction, Multiplication, Division, Block Transfer & Exchange operations.</p>	<p>9) Execute the program of Memory Block Transfer or Memory block Exchange.</p> <p>10)Execute the program of to find odd number or even number</p> <p>11)Execute the program of 8 bit Multiplication using 8085 microprocessor.</p> <p>12) Execute the program of 8 bit Division using 8085 microprocessor</p>
March	Practical Exam Related Work	
April	Theory Exam Related Work	.

