Mahavir Mahavidyalaya, Kolhapur

Department of Electronics

Teaching Plan 2025-26

B.Sc- I

Course Teacher: Prof. P.A. Kshirsagar

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

Month	Theory	Practical
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) Anaylze 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 De-multiplexer .	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, Reproduciability), Temperature Sensor : Thermocouple, RTD, LM35.	1)Study (R-2R Ladder) Using DAC.

	B) Signal Conditioning& Data Convertors: Introduction, Signal conditioning of passive sensors using Wheatstone's bridge. **Filters:** Concept, Active filters, Passive Filters (Low Pass, high pass) .	
January	**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. **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.	2)Study of Asynchorous UP Or Down counter.
February	**C) Digital Instruments & Display devices:** Digital Multimeter, Digital Frequency Meter, Concept of Digital Storage Oscilloscope, Digital Displays : LCD, LED.	3)Study of Universal Shift Register.
March	Practical Exam Related Work	
April	Theory Exam Related Work	

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

Month	Theory	Practical
December	**Unit I :** **Sequential Circuits:** **A)Concept of sequential circuits :** Types of Flip-flops: RS, Clocked RS,	1)Execute the program of 1's Complement of 8 bit number using

	Latch, D (edge triggered), JK, Master-Slave JK. **B)Counter :** Types of counters, concept of synchronous counters, asynchronous counters, 4-bit Ripple counter, Shift Register.	8085 microprocessor. 2) Execute the program of 1's Complement of 16 bit number using 8085 microprocessor. 3) Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor 4)Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor.
January	**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).	**5)** Execute the program of Addition of two 8 bit data using 8085 microprocessor. **6)** Execute the program Addition of two 16 bit data using 8085 microprocessor using 8085 microprocessor. **7)** Execute the program of Subtraction of two 8 bit data using 8085 microprocessor. **8)** Execute the program of Subtraction of two16 bit data using 8085 microprocessor

February	**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.	**9)** Execute the program of Memory Block Transfer or Memory block Exchange. 10)Execute the program of to find odd number or even number 11)Execute the program of 8 bit Multiplication using 8085 microprocessor. **12)** Execute the program of 8 bit Division using 8085 microprocessor
March	Practical Exam Related Work	
April	Theory Exam Related Work	.

Teaching Plan 2025-26

B.Sc Computer Science (Entire)- I

Course Teacher: Miss. S. D. Patil

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

Month	Theory	Practical
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) Anaylze the operation of transistor Working as an electronic Switch (Use LED and relay

		in the circuit.)
September	**UNIT II** **B) 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). **Oscillators :** RC-phase shift, LC type: Colpitt's oscillator, Hartley's oscillator, Applications of Amplifiers and Oscillators.	4) Demonstrate Op-Amp Adder by using IC741. 5) Demonstrate Op-Amp as Subtractor by using IC741.
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:**	1) Implementation

	C) 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. **D) Computer Codes**: Introduction and definition, BCD, ASCII & Gray Code.	of Logic gates. 2) Implementation of Universal building block (NAND & NOR). 3) Demonstrate the Half Adder.
September	**UNIT II :** **B) 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	C) **Combinational Circuits** : Introduction,Half adder, Full adder, Half & Full Subtractor, Multiplexer and De-multiplexer .	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 :** **D) Sensors& Transducers:** Definition of Transducers & Sensors, Classification of transducers & Sensors, Characteristics of Transducers, Specifications of Transducers (Accuracy, Range, Linearity, Sensitivity, Resolution, Reproduciability), Temperature Sensor : Thermocouple, RTD, LM35. **E) Signal Conditioning& Data Convertors:** Introduction, Signal conditioning of passive sensors using Wheatstone's bridge. **Filters:** Concept, Active filters, Passive Filters (Low Pass, high pass) .	1) Study (R-2R Ladder) Using DAC.
January	**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. **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.	2) Study of Asynchorous UP Or Down counter.
February	**F) Digital Instruments & Display devices:** Digital Multimeter, Digital Frequency Meter, Concept of Digital Storage Oscilloscope, Digital Displays : LCD, LED.	3) Study of Universal Shift Register.
March	Practical Exam Related Work	
April	Theory Exam Related Work	

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

Month	Theory	Practical
December	**Unit I :** **Sequential Circuits:** **A)Concept of sequential circuits :** Types of Flip-flops: RS, Clocked RS, Latch, D (edge triggered), JK, Master-Slave JK. **B)Counter :** Types of counters, concept of synchronous counters, asynchronous counters, 4-bit Ripple counter, Shift Register.	1)Execute the program of 1's Complement of 8 bit number using 8085 microprocessor. 2) Execute the program of 1's Complement of 16 bit number using 8085 microprocessor. 3) Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor 4)Execute the program of 2's Complement of 8 bit number using 8085 Microprocessor.
January	**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).	**5)** Execute the program of Addition of two 8 bit data using 8085 microprocessor. **6)** Execute the program Addition of two 16 bit data using 8085 microprocessor using 8085 microprocessor. **7)** Execute the program of

		Subtraction of two 8 bit data using 8085 microprocessor. **8)** Execute the program of Subtraction of two16 bit data using 8085 microprocessor
February	**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.	**9)** Execute the program of Memory Block Transfer or Memory block Exchange. 10)Execute the program of to find odd number or even number 11)Execute the program of 8 bit Multiplication using 8085 microprocessor. **12)** Execute the program of 8 bit Division using 8085 microprocessor
March	Practical Exam Related Work	
April	Theory Exam Related Work	.