DEPARTMENT OF ELECTRONICS
LESSION Plan
Session 2023-24
SEMESTER – IV

Name of Teacher: Dr. Subhro Ghosal

Paper Allotted: ELSACOR08T (Operational Amplifiers and Applications), ELSACOR08P (Operational Amplifiers and Applications), ELSACOR09T (Signals and Systems)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	ELSACOR08T	Unit-1: 7uBasic Operational Amplifier: Concept of differential amplifiers (Dual input balanced and unbalanced output), constant current bias, current mirror, cascaded differential amplifier stages with concept of level translator, block diagram of an operational amplifier (IC 741) Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.	18
	ELSACOR08P	1. Study of op-amp characteristics: CMRR and Slew rate. 2. Designing of an amplifier of given gain for an inverting and non-inverting configuration using an op-amp. 3. Designing of analog adder and subtractor circuit. 4. Designing of an integrator using op-amp for a given specification and study its frequency response.	12
April 2024	ELSACOR08T	Unit-2: Op-Amp Circuits: Open and closed loop configuration, Frequency response of an op-amp in open loop and closed loop configurations, Inverting, Non-inverting, Summing and difference amplifier, Integrator, Differentiator, Voltage to current converter, Current to voltage converter. Comparators: Basic comparator, Level detector, Voltage limiters, Schmitt Trigger. Signal generators: Phase shift oscillator, Wein bridge oscillator, Square wave generator, triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566).	18
	ELSACOR08P	5. Designing of a differentiator using op-amp for a given specification and study its frequency response. 6. Designing of a First Order Low-pass filter using op-amp. 7. Designing of a First Order High-pass filter using op-amp. 8. Designing of a RC Phase Shift Oscillator using op-amp.	12
	ELSACOR09T	Unit-3: Fourier Series Representation of Periodic Signals: Continuous-Time periodic signals, Convergence of the Fourier series, Properties of continuous-Time Fourier series, Discrete-Time periodic signals, Properties of Discrete-Time Fourier series. Frequency-Selective filters, Simple RC highpass and	9

Month	Paper	Topic	No of classes
May 2024	**ELSACOR08T**	**lowpass filters** **Unit-3: Multivibrators (IC 555): Block diagram, Astable and monostablemultivibrator circuit, Applications of Monostable and Astablemultivibrators. Phase locked loops (PLL): Block diagram, phase detectors, IC565. Fixed and variable IC regulators: IC 78xx and IC 79xx -concepts only, IC LM317- output voltage equation** **Signal Conditioning circuits: Sample and hold systems, Active filters: First order low pass and high pass Butterworth filter, Second order filters** **Band pass filter, Band reject filter, All pass filter, Log and antilog amplifiers.**	**18**
	ELSACOR08P	**9. Study of IC 555 as an astable multivibrator.** **10. Study of IC 555 as monostable multivibrator.** **11. Designing of Fixed voltage power supply using IC regulators using 78 series and 79 series**	**12**
	ELSACOR09T	**Unit-3: Fourier Transform: Aperiodic signals, Periodic signals, Properties of Continuous-time Fourier transform, Convolution and Multiplication Properties, Properties of Fourier transform and basic Fourier transform Pairs.**	**9**
1ˢᵗ Week of June 2024		**Internal Examination & Class for Slow Learners**	**4**
July 2024		**END SEMESTER EXAMINATION**	
Total Classes			**112**

Name of Teacher: **Dr. Prosenjit Roy Chowdhury**

Paper Allotted: ELSGCOR04T (Microprocessor and Microcontroller)

Month	Paper	Topic	No of classes
March 2024 **(02.03.2024)**	**ELSGCOR04T**	**Unit-1: Microcomputer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.** **8085 Microprocessor Architecture: Main features of 8085. Block diagram. Pin-out diagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.** **8085 Programming : Instruction classification, Instructions set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts**	**23**

Month	Paper	Topic	No of classes
April 2024	ELSGCOR04T	Unit-2: 8051 microcontroller: Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions. 8051 I/O port programming: Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation. 8051 Programming: 8051 addressing modes and accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, 8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.	20
May 2024	ELSGCOR04T	Unit-3: Introduction to embedded system: Embedded systems and general purpose computer systems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.	5
1st Week of June 2024		Internal Examination & Class for Slow Learners	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			52

Name of Teacher: Ayan Kanti Pradhan

Paper Allotted: ELSACOR10T (Electronic Instrumentation), ELSACOR10P (Electronic Instrumentation Lab), ELSGCOR04P (Microprocessor and Microcontroller Lab)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	ELSACOR10T	Unit-4: Transducers and sensors: Classification of transducers, Basic requirement/characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers.	7
	ELSACOR10P	1. Design of multi range ammeter and voltmeter using galvanometer. 2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity. 3. Measurement of Capacitance by de'Sautys.	12

Month	Paper	Topic	No of classes
	ELSGCOR04P	1. Addition and subtraction of numbers using direct addressing mode 2. Addition and subtraction of numbers using indirect addressing mode	12
April 2024	ELSACOR10T	Unit-4: Measurement of displacement, velocity and acceleration (translational and rotational). Measurement of pressure (manometers, diaphragm, bellows), Measurement of temperature (RTD, thermistor, thermocouple, semiconductor IC sensors), Light transducers (photoresistors, photovoltaic cells, photodiodes).	7
	ELSACOR10P	4. Measure of low resistance by Kelvin's double bridge. 5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.) 6. To determine the Characteristics of LVDT. 7. To determine the Characteristics of Thermistors and RTD.	12
	ELSGCOR04P	3. Multiplication by repeated addition. 4. Division by repeated subtraction.	12
May 2024	ELSACOR10P	8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type. 9. To study the Characteristics of LDR, Photodiode, and Phototransistor: a. Variable Illumination. b. Linear Displacement. 10. Characteristics of one Solid State sensor/ Fiber optic sensor	12
	ELSGCOR04P	5. Handling of 16-bit Numbers. 6. Use of CALL and RETURN Instruction. 7. Block data handling. Other programs (e.g. Parity Check, using interrupts, etc.).	12
1st Week of June 2024		Internal Examination & Class for Slow Learners	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			90

Name of Teacher: Dr. Aswini Kumar Mallick

Paper Allotted: ELSACOR09T (Signals and Systems), ELSACOR09P (Signals and Systems Lab)

Month	Paper	Topic	No of classes
March 2024	ELSACOR09T	Unit-1: Signals and Systems: Continuous and discrete time signals, Transformation of the independent variable, Exponential and sinusoidal signals, Impulse and unit step functions, Continuous-Time and Discrete-Time Systems, Basic System Properties..	17

(02.03.2024)	**ELSACOR09P**	1. Generation of Signals: continuous time 2. Generation of Signals: discrete time 3. Time shifting and time scaling of signals.	**12**
April 2024	**ELSACOR09T**	Unit-2: Linear Time -Invariant Systems (LTI): Discrete time LTI systems, the Convolution Sum, Continuous time LTI systems, the Convolution integral. Properties of LTI systems, Commutative, Distributive, Associative. LTI systems with and without memory, Invariability, Causality, Stability, Unit Step response. Differential and Difference equation formulation, Block diagram representation of first order systems.	**13**
	ELSACOR09P	4. Convolution of Signals 5. Solution of Difference equations. 6. Fourier series representation of continuous time signals.	**12**
May 2024	**ELSACOR09T**	Unit-4: Laplace Transform: Laplace Transform, Inverse Laplace Transform, Properties of the Laplace Transform, Laplace Transform Pairs, Laplace Transform for signals, Laplace Transform Methods in Circuit Analysis, Impulse and Step response of RL, RC and RLC circuits..	**12**
	ELSACOR09P	7. Fourier transform of continuous time signals. 8. Laplace transform of continuous time signals. 9. Introduction to Xcos/similar function and calculation of output of systems represented by block diagrams.	**12**
1ˢᵗ Week of June 2024		**Internal Examination & Class for Slow Learners**	**4**
July 2024		**END SEMESTER EXAMINATION**	
Total Classes			**82**

Name of Teacher: Ruma Bhattacharjee

Paper Allotted: ELSACOR10T (Electronic Instrumentation), ELSGCOR04P (Microprocessor and Microcontroller Lab)

Month	Paper	Topic	No of classes
March 2024 (02.03.2024)	**ELSACOR10T**	**Unit-3: Oscilloscope: CRT, wave form display and electrostatic focusing, time base and sweep synchronization.**	**4**
	ELSGCOR04P	**1. Addition and subtraction of numbers using direct addressing mode 2. Addition and subtraction of numbers using indirect addressing mode**	**12**
April 2024	**ELSACOR10T**	**Unit-3: Oscilloscope: Measurement of voltage, frequency and phase by CRO, Oscilloscope probes.**	**6**
	ELSGCOR04P	**3. Multiplication by repeated addition. 4. Division by repeated subtraction.**	**12**

May 2024	**ELSACOR10T**	**Unit-3: Oscilloscope: Dual trace oscilloscope, sampling oscilloscope, DSO and power scope** **Unit-3: Signal Generators.**	**6**
	ELSGCOR04P	**5. Handling of 16-bit Numbers.** **6. Use of CALL and RETURN Instruction.** **7. Block data handling. Other programs (e.g. Parity Check, using interrupts, etc.).**	**12**
1st Week of June 2024		**Internal Examination &** **Class for Slow Learners**	**4**
July 2024		**END SEMESTER EXAMINATION**	
Total Classes			**56**