Lesson Plan

Name of the Faculty : Shakti Raj Singh, Programmer(Academic)
Semester : 2nd
Subject : Analog Electronics
Duration : 15 weeks (20.01.25 to 02.05.25) , Periods/Week -L-2, P-4

Week	Lecture Day	Theory	Practical
Week 1	1	**UNIT I** Semiconductors and Diodes: Electrons- free and valence. Conductors, Insulators, and Semiconductors	Familiarity with working knowledge of the following Instruments. (a) CRO (b) Multimeter (c) Function generator (d) Regulated power supply (e) Active passive components (f) Bread Board
	2	definition & energy band diagrams. Properties of semiconductors. Meaning of Hole current, electron- hole pairs, recombination, doping	Familiarity with working knowledge of the following Instruments. (a) CRO (b) Multimeter (c) Function generator (d) Regulated power supply (e) Active passive components (f) Bread Board
Week 2	1	acceptor and donor impurities. Intrinsic and Extrinsic, N and P type semiconductors	Study of V-I Characteristics of a Diode.
	2	Diode- formation, depletion region, VI Characteristics, ratings, types and applications.	Study of V-I Characteristics of a Diode.
Week 3	1	Zener diode- reverse bias characteristics, voltage regulation, shunt voltage regulator, and applications. Varistor and Thermistor working and applications	Study and draw the characteristics of half wave and full wave rectifiers.
	2	Revision	Study and draw the characteristics of half wave and full wave rectifiers.

Week 4	1	UNIT **II** Transistors and MOSFETs: Transistors- definition, terminals, types, symbols, formation of NPN and PNP, ratings	Study and draw the characteristics of rectifier filter circuit.
	2	Transistor biasing- definition, importance, list types, stabilisation, thermal runaway, heat sink, and voltage divider method. List configurations and applications	Study and draw the characteristics of rectifier filter circuit.
Week 5	1	Alpha and Beta- definitions, relation. CE input and output characteristics- cut off, saturation, and active regions	Study of Clipping & Clamping circuit.
	2	Transistor as a switch. List applications. FET- definition, types. MOSFET- definition, types, symbols.	Study of Clipping & Clamping circuit.
Week 6	1	N type enhancement mode- construction, working, characteristics, switch. List applications and ratings. Differentiate BJT and MOSFET.	Study zener diode characteristics.
	2	Revision	Study zener diode characteristics.
Week 7	1	UNIT **III** Rectifiers, filters and regulators: Regulated power supply- block diagram and applications. Rectifiers-	Study zener diode as voltage regulator.
	2	Rectifiers- definition, half wave, centre tapped and bridge full wave rectifier, efficiency, ripple factor, PIV, ratings	Study zener diode as voltage regulator.
Week 8	1	Filters- definition, necessity, C and PI filters, Regulator-definition	Study the characteristics of transistor in Common Base configuration.
	2	working of 7805, operating voltages- 7809, 7812, 7905, 7912.	Study the characteristics of transistor in Common Base configuration.
Week 9	1	UNIT **IV**	Plot and study the input and output characteristics of BJT

		Amplifiers and Oscillators: Amplifier- definition, faithful amplification, classification based on configuration, power, and frequency.	in common emitter configuration.
	2	Transistor CE amplifier with biasing. Working of class A, B, C, and Push pull amplifier. Two stage RC coupled amplifier working, gain in dB, frequency response.	Plot and study the input and output characteristics of BJT in common emitter configuration.
Week 10	1	Feed back- definition, types, advantages and disadvantages, applications. Oscillators-definition, classification, LC tank circuit, criteria.	Graphical determination of small signal hybrid parameter of BJT.
	2	RC phase shift and crystal oscillator-working, applications. CRT-construction, working and applications.	Graphical determination of small signal hybrid parameter of BJT.
Week 11	1	UNIT **V** OP-AMP and Timers: OPAMP—definition, block diagram, operation, characteristics, applications, [tA 741 pin diagram. Definitions of virtual ground	Study and draw the characteristics of FET in common source configuration Study characteristics of SCR.
	2	CMRR and Slew rate. OPAMP applications— inverting, integrator, differentiator, summer, voltage follower, and comparator	Study and draw the characteristics of FET in common source configuration Study characteristics of SCR.
Week 12	1	Filters- definition, Working- low pass, high pass passive and active filters, applications. Timers—block diagram	Study of characteristics of DIAC. Plot V-I characteristic of TRIAC. Study and draw the characteristics of FET in common drain configuration.
	2	pin diagram of 555, duty cycle, time constant, applications	Study of characteristics of DIAC.

			Plot V-I characteristic of TRIAC. Study and draw the characteristics of FET in common drain configuration.
Week 13	1	Multi-vibrators Astable and monostable using 555.	Study the Series and Shunt Voltage Regulator. Study of frequency response of active filters HP, LP & BP.
	2	Revision	Study the Series and Shunt Voltage Regulator. Study of frequency response of active filters HP, LP & BP.
Week 14		Revision	Revision
Week 15		Revision	Revision