INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad – 500043

Electronics and Communication Engineering

List of Laboratory Experiments

ELECTRONIC DEVICES AND CIRCUITS LABORATORY								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AECC05	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	0	3	1.5	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 36**				**Total Classes:36**		
Branch: ECE	**Semester: III**	**Academic Year: 2021-22**				**Regulation: UG20**		

Course overview:

This course provides the hands-on experience by examining the voltage-current characteristics of diodes, Bipolar Junction Transistors, Field Effect Transistors and its applications. Analyze the devices for measuring device characteristic parameters for designing semiconductor circuits. Extract the characteristics of semiconductor devices using multisim simulation tool.

Course objectives:

The students will try to learn:

   I.   The behavior and characteristics of semiconductor devices for designing the semiconductor circuits such as amplifier and rectifiers.

   II.   Estimation of device characteristics like gain, bandwidth, input and output resistance of bipolar junction transistors and field effect transistors amplifiers to derive appropriate small-signal model analysis of basic amplifier circuits.

   III.   The analytical skills to model analog and digital integrated circuits at discrete and micro circuit level.

Course outcomes:

After successful completion of the course, students should be able to:

CO1: Analyze the semiconductor diode characteristics for measuring the static, dynamic resistances and cut-in voltage.

CO2: Construct the pn junction diode and Zener diode characteristics for the diode applications such as rectifiers and voltage regulator.

CO3: Examine the input and output characteristics of transistor (BJT and FET) configurations for determining the input - output resistances.

CO4: Compare BJT and FET amplifiers for estimating the voltage gainand Current gain.

CO5: Calculate the intrinsic stand-off ratio of the uni junction transistorusing volt – ampere characteristics.

CO6: Determine holding, latching current and break over voltage of silicon controlled rectifier using volt – ampere characteristics.

WEEK NO	EXPERIMENT NAME	CO
WEEK – I	**ELECTRONIC WORKSHOP PRACTICE**	**CO1**
	Identification, specifications, testing of R, L, C components (Color Codes), potentiometers, switches (SPDT, DPDT and DIP), coils, gang condensers, relays, bread boards, PCBs, identification, specifications and testing of active devices, diodes, BJTs, low power JFETs, MOSFETs, power transistors, LEDs, LCDs, optoelectronic devices, SCR, UJT,DIACs.	
WEEK – II	**ELECTRONIC WORKSHOP PRACTICE**	**CO1**
	Study and operation of a. Multimeters (Analog and Digital) b. Function Generator c. Regulated Power Supplies	

	d. Study and Operation of CRO	
WEEK – III	**PN DIODE CHARACTERISTICS**	**CO1**
	Verification of V-I characteristics of PN diode and calculate static and dynamic resistance usinghardware and digital simulation.	
WEEK – IV	**ZENER DIODE CHARACTERISTICS AND VOLTAGE REGULATOR**	**CO2**
	Verification of V-I characteristics of Zener diode and perform Zener diode as a Voltage regulator usinghardware and digital simulation.	
WEEK – V	**HALF WAVE RECTIFIER**	**CO2**
	Verification of half wave rectifier without and with filters using hardware and digital simulation.	
WEEK – VI	**FULL WAVE RECTIFIER**	**CO2**
	Verification of Full Wave Rectifier without and with filters using hardware and digital simulation.	
WEEK – VII	**TRANSISTOR CB CHARACTERISTICS**	**CO3**
	Verification of Input and Output characteristics of CB configuration using hardware and digital simulation.	
WEEK –VIII	**TRANSISTOR CE CHARACTERISTICS**	**CO3**
	Verification of Input and Output Characteristics of CE configuration using hardware and digital simulation.	
WEEK - IX	**FREQUENCY RESPONSE OF CE AMPLIFIER**	**CO4**
	Determine the Gain and Bandwidth of CE amplifier using hardware and digital simulation.	
WEEK - X	**FREQUENCY RESPONSE OF CC AMPLIFIER**	**CO4**
	Determine the Gain and Bandwidth of CC amplifier using hardware and digital simulation.	
WEEK - XI	**UJT CHARACTERISTICS**	**CO5**
	Verification of V-I Characteristics of UJT using hardware and digital simulation.	
WEEK - XII	**SCR CHARACTERISTICS**	**CO6**
	Verification of V-I Characteristics of SCR using hardware and digital simulation.	
WEEK - XIII	**FET CHARACTERISTICS**	**CO4**
	Verification of V-I Characteristics of FET using digital simulation.	
WEEK - XIV	**FREQUENCY RESPONSE OF CS AMPLIFIER**	**CO4**
	Determine the Gain and Bandwidth of CS amplifier using digital simulation.	
WEEK - XV	**FREQUENCY RESPONSE OF CD AMPLIFIER**	**CO4**
	Determine the Gain and Bandwidth of CS amplifier using digital simulation.	