

LABORATORY

➤ LIST OF MAJOR EQUIPMENTS/FACILITIES

Department of Electronics and Communication Engineering

Branch : ECE

Lab : RF

Year : IV

Sem : VII

<i>Sl.No</i>	<i>Component Name</i>	<i>Quantity</i>	<i>Rate Rs</i>	<i>Amount Rs</i>
1	Spectrum analyzer without tracking generator	2	85000	1,70,000
2	Digital Storage Oscilloscope	2	64000	1,28,000
3	RF Modulation Communication Training	1 set	2,18,722	2,18,722
4	RF Component Kit	1 set		
5	RF Signal Source	2		
6	RF Signal detector	2		
7	Advanced Antenna training system	1 set	2,32,391	2,32,391
8	Add-on Antenna training system	1 set		

Branch : ECE
Year : III

Lab : DSP

Sem : V

<i>SL.N o</i>	<i>Component Name</i>	<i>Quantity</i>	<i>Rate Rs</i>	<i>Amount Rs</i>
1	Analog communication training Lab	2	50000	50000

Branch : ECE
Year : IV

Lab : MW&OC
Sem : VII

<i>SL.N o</i>	<i>Component Name</i>	<i>Quantity</i>	<i>Rate Rs</i>	<i>Amount Rs</i>
1	Reflex klystron bench setup [42 components]	2	58,536	1,17,072
2	Reflex klystron bench setup [22 components]	1	58,536	58,536
3	Reflex klystron bench setup [19 components]	1	59,530	59,530
4	Gunn Diode bench setup	1	54,960	54,960
5	Gunn Diode with Antenna	1	84,885	84,885
6	J band Microwave test bench	1	79,388	79,388
7	Microwave power meter with thermister mount	1	2,27,900	2,27,900
8	Microwave power meter with thermister mount	1	2,20,000	2,20,000
9	LD mounted sources wave length at 1310 nm	1	69,006	69,006

Branch : ECE
Year : III

Lab : ESD
Sem : VI

<i>Sl.No</i>	<i>Component Name</i>	<i>Quantity</i>	<i>Rate</i> <i>Rs</i>	<i>Amount</i> <i>Rs</i>
1	Design of high current linear variable DC power supply	1	69006.45	69006.45
2	PCB layout design using CAD [Edwin XP version]	1	100000	100000

➤ LIST OF EXPERIMENTAL SETUP

Year : I
Subject : PHYSICS LABORATORY
Code : PH2112
Branch : ECE

PH2112

PHYSICS LABORATORY

(Common to all branches of B.E / B.Tech Programmes)

L T P M
0 0 3 100

LIST OF EXPERIMENTS

(Any 10 Experiments)

1. Spectrometer - Dispersive power of a prism.
2. Spectrometer - Determination of wavelength of Hg source using Grating.
3. Air wedge - Determination of thickness of a thin wire.
4. Semiconductor laser - (a) Determination of wavelength of Laser using Grating
(b) Particle size determination.
5. Fiber optics - Determination of Numerical Aperture, Acceptance angle and loss in an Optical Fibre
6. Band gap determination of a Semiconductor
7. Black body radiation - Wien's law
8. Michelson's interferometer
9. Lees' disc - Determination of thermal conductivity of a bad conductor.
10. Ultrasonic Interferometer- Velocity of ultrasonic waves in a liquid and compressibility of the liquid.
11. Poisson's ratio - elliptical fringes.
12. Non-Uniform Bending - Determination of Young's modulus.

13. Torsional Pendulum - Determination of Moment of Inertia of disc and Rigidity Modulus of the material of a wire.

14. Computers simulation of wave propagation.

15. BH curve using CRO.

P = 45 Periods

➤ Physics Laboratory classes will be conducted on alternate weeks with 3 periods duration.

Year : I
Subject : CHEMISTRY LABORATORY
Code : CY2112
Branch : ECE

CY2112

CHEMISTRY LABORATORY

(Common to all branches of B.E. / B.Tech Programmes)

L T P M
0 0 3 100

LIST OF EXPERIMENTS
(Any 10 Experiments)

- 1) Weighing and preparation of standard solutions
 - (a) Preparation of molar and normal solutions of the following substances-oxalic acid, sodium carbonate and hydrochloric acid.
 - (b) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson's equation.
- 2) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
- 3) Determination of alkalinity of water sample.
- 4) Determination of chloride content of water sample by argentometry.
- 5) Determination of DO content by Winkler's method.
- 6) Estimation of copper in brass.
- 7) Determination of strength of Hydrochloric acid by pH metry.
- 8) Conductometric titration between strong acid and strong base.
- 9) Conductometric titration of mixture of acids.
- 10) Conductometric precipitation titration using barium chloride and sodium sulphate.
- 11) Determination of strength of iron by potentiometric method using potassium dichromate.
- 12) Estimation of iron (1,10 - phenanthroline / thiocyanate method) or Ni (DMG) in the given solution by spectrometric method

- 13) Determination of sodium and potassium ions in water sample by flame photometric method.
- 14) Determination of molecular weight of a polymer by viscometry method.
- 15) Determination of percentage of calcium in limestone by EDTA method.

P = 45 Periods

References for Chemistry Laboratory

- (1) J. Mendham, R.C. Denney, J.D. Barnes and N.J.K. Thomas, "Vogel's Textbook of Quantitative Chemical Analysis", 6th Edition, Pearson Education, 2004.
 - (2) D.P. Shoemaker and C.W. Garland, "Experiments in Physical Chemistry", McGraw Hill, London.
- Chemistry Laboratory classes will be conducted on alternate weeks with 3 periods duration

Year : I
 Subject : ENGINEERING PRACTICES LABORATORY
 Code : GE2113
 Branch : ECE

GE2113	ENGINEERING PRACTICES LABORATORY	L T P M
	(Common to all branches of B.E. / B.Tech.)	0 0 2 100

AIM

To provide an exposure of basic engineering practices to the student.

Objectives

To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE (12)

Buildings:

- (a) Study of plumbing and carpentry components of residential and industrial buildings.

Plumbing Works:

- a. Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
- b. Study of pipe connections requirements for pumps and turbines..
- c. Preparation of plumbing line sketches for water supply and sewage works.

d. Hands- on - Exercise:.

Basic pipe connections - Mixed pipe material connection - pipe connections with different joining components.

e. Demonstration of plumbing requirements of high-rise buildings.

Carpentry:

a. Study of the joints in roofs, doors, windows and furniture.

b. Hands - on - exercise -woodwork, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

(18)

Welding

(a) Preparation of arc welding of butt joints, lap joints and tee joints.

(b) Gas welding practice.

Basic Machining

(a) Simple Turning and Taper turning

(b) Drilling practice

Machine assembly practice

(a) Study of centrifugal pump

(b) Study of air conditioner

Demonstration on

(a) Smithy operations, upsetting, swaging, setting down and bending. Example - Exercise - production of hexagonal headed bolt.

(b) Foundry operations like mould preparation for gear and step cone pulley.

(c) Fitting - Exercises - preparation of square fitting and Vee - fitting models.

GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE

(12)

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.

2. Fluorescent lamp wiring

3. Stair-case wiring

4. Measurement of electrical quantities - voltage, current, power & power factor

in RLC circuit.

5. Measurement of energy using single phase energy meter.
6. Measurement of resistance to earth of an electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE (18)

Any SIX Experiments

1. (a) Study of Electronic components and equipment (i) Resistor colour coding (ii) usage of CRO & Multimeter.
(b) Soldering of simple electronic components and checking the continuity.
(c) Assembling electronic components on a PCB.
2. Characteristics of PN & Zener Diodes.
3. Measurement of ripple factor for HWR & FWR.
4. Input and output characteristics of CE transistor.
5. Characteristics of JFET.
6. Applications of operational amplifier - Inverter, adder and subtractor.
7. Study of digital circuits - logic gates, adder and decade counter.

P = 60 Periods

Year : II
Semester : III
Subject : ELECTRICAL MACHINES LABORATORY
Code : EE 1261
Branch : ECE

List of Experiments

1. Open circuit and load characteristics of separately excited and self excited D.C. generator.
2. Load test on D.C. shunt motor.
3. Load test on D.C. series motor.
4. Swinburne's test and speed control of D.C. shunt motor.
5. Load test on single phase transformer and open circuit and short circuit test on single phase transformer
6. Regulation of three phase alternator by EMF and MMF methods.
7. Load test on three phase induction motor.
8. No load and blocked rotor tests on three phase induction motor (Determination of equivalent circuit parameters)
9. Load test on single-phase induction motor.
10. Study of D.C. motor and induction motor starters.

Year : II
Semester : III
Subject : ELECTRONIC DEVICES AND CIRCUITS LAB -I

Code : EC1204
Branch : ECE

List of Experiments

- Ex.1: Diode Forward characteristics.
1.Determination of η from the plot of $\ln I$ vs V .
2.Determinations reverse saturation current.
[Note that reverse characteristics of Diodes cannot be measured using common instruments available in the Lab.]
- Ex.2: Input and Output characteristics of BJT.
10.0Determination of h parameters from the graph.
- Ex.3: Output characteristics of JFET.
13.Plot of Transfer characteristics from the output characteristics.
14.Determination of pinch off voltage and I_{dss}
- Ex.4: Fixed Bias amplifier circuits using BJT.
1.Waveforms at input and output without bias.
2.Determination of bias resistance to locate Q-point at center of load line.
3.Measurement of h_{FE} and gain.
4.Calculation of $h_{ie} = V_T / I_{BDC}$ and gain assuming $h_{FE} = h_{fe}$.
5.Plot of frequency response.
- Ex.5: BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.
(i) Measurement of input resistance and gain
(ii) Comparison with calculated values.
(iii) Plot of DC collector current as a function of collector resistance (application as constant current circuit).
- Ex.6: Source follower with Bootstrapped gate resistance.
•Measurement of gain, input resistance and output resistance with and without Bootstrapping .
•Comparison with calculated values.
- Ex.7: Class B Complementary symmetry power amplifier
1.Observation of the output wave form with cross over Distortion.
2.Modification of the circuit to avoid cross over distortion.
3.Measurement of maximum power output.
4.Determination of efficiency.
5.Comparison with calculated values.
- Ex.8: Differential amplifier using BJT.
a)Construction of the circuit.
b)Measurement of DC collector current of individual transistors.
c)Equalization of DC current using individual emitter resistance (50 – 100 Ohms)
d)Measurement of CMRR.
- Ex.9: Power supply Full wave rectifier with simple capacitor filter.
(i) Measurement of DC voltage under load and ripple factor, Comparison with calculated values.
(ii) Measurement of load regulation characteristics (V_{out} vs I_{out}).
Comparison with calculated values.

Ex.10: Measurement of UJT and SCR Characteristics.

1. Firing Characteristics of SCR.
2. Measurement of Intrinsic stand off ratio of UJT.

Year : II
Semester : III
Subject : **DATA STRUCTURES LAB**
Code : **CS1152**
Branch : ECE

List of Experiments

Implement the following exercises using C:

1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files

- (a) Program for 'Balanced Paranthesis'
- (b) Array implementation of Stack ADT
- (c) Linked list implementation of Stack ADT
- (d) Program for 'Evaluating Postfix Expressions'

An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
8. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
9. Queue ADT
10. Search Tree ADT - Binary Search Tree
11. Heap Sort
12. Quick Sort

Year : II
Semester : IV
Subject : **ELECTRONICS CIRCUITS II AND SIMULATION LAB**
Code : **EC1256**
Branch : ECE

List of Experiments

1. Series and Shunt feedback amplifiers:
Frequency response, Input and output impedance calculation
2. Design of RC Phase shift oscillator: Design Wein Bridge Oscillator
3. Design of Hartley and Colpitts Oscillator
4. Tuned Class C
5. Integrators, Differentiators, Clippers and Clampers
6. Design of Astable and Monostable and Bistable multivibrators

SIMULATION USING PSPICE:

1. Differentiate amplifier
2. Active filter : Butterworth IInd order LPF
3. Astable, Monostable and Bistable multivibrator - Transistor bias
4. D/A and A/D converter (Successive approximation)
5. Analog multiplier
6. CMOS Inverter, NAND and NOR

Year : II
Semester : IV
Subject : **LINEAR INTEGRATED CIRCUITS LAB**
Code : **EC1257**
Branch : ECE

List of Experiments

Design and testing of:

1. Inverting, Non inverting and Differential amplifiers.
2. Integrator and Differentiator.
3. Instrumentation amplifier.
4. Active lowpass and bandpass filter.
5. Astable, Monostable multivibrators and Schmitt Trigger using op-amp.
6. Phase shift and Wien bridge oscillator using op-amp.
7. Astable and monostable using NE555 Timer.
8. PLL characteristics and Frequency Multiplier using PLL.
9. DC power supply using LM317 and LM723.
10. Study of SMPS control IC SG3524 / SG3525.

Year : II
Semester : IV
Subject : **DIGITAL ELECTRONICS LAB**
Code : **EC1258**
Branch : ECE

List of Experiments

1. Design and implementation of Adders and Subtractors using logic gates.
2. Design and implementation of code converters using logic gates
 - (i) BCD to excess-3 code and vice versa
 - (ii) Binary to gray and vice-versa
3. Design and implementation of 4 bit binary Adder/ subtractor and BCD adder using IC 7483
4. Design and implementation of 2Bit Magnitude Comparator using logic gates 8 Bit Magnitude Comparator using IC 7485
5. Design and implementation of 16 bit odd/even parity checker generator using IC74180.
6. Design and implementation of Multiplexer and De-multiplexer using logic gates and study of IC74150 and IC 74154
7. Design and implementation of encoder and decoder using logic gates and study of IC7445 and IC74147
8. Construction and verification of 4 bit ripple counter and Mod-10 / Mod-12 Ripple counters
9. Design and implementation of 3-bit synchronous up/down counter
10. Implementation of SISO, SIPO, PISO and PIPO shift registers using Flip- flops

Year : III
Semester : V
Subject : DIGITAL SIGNAL PROCESSING LABORATORY
Code : EC1306
Branch : ECE

List of Experiments

USING TMS320C5X

1. Study of various addressing modes of DSP using simple programming examples
2. Sampling of input signal and display
3. Implementation of FIR filter
4. Calculation of FFT

USING MATLAB

1. Generation of Signals
2. Linear and circular convolution of two sequences
3. Sampling and effect of aliasing
4. Design of FIR filters
5. Design of IIR filters
6. Calculation of FFT of a signal

Year : III
Semester : V
Subject : **MICROPROCESSOR AND APPLICATIONS LAB**
Code : **EC1307**
Branch : ECE

List of Experiments

1. Programs for 8/16 bit Arithmetic operations (Using 8085).
2. Programs for Sorting and Searching (Using 8085, 8086).
3. Programs for String manipulation operations (Using 8086).
4. Programs for Digital clock and Stop watch (Using 8086).
5. Interfacing ADC and DAC.
6. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255.
7. Interfacing and Programming 8279, 8259, and 8253.
8. Serial Communication between two MP Kits using 8251.
9. Interfacing and Programming of Stepper Motor and DC Motor Speed control.
10. Programming using Arithmetic, Logical and Bit Manipulation instructions of 8051 microcontroller.
11. Programming and verifying Timer, Interrupts and UART operations in 8031 microcontroller.
12. Communication between 8051 Microcontroller kit and PC.

Year : III
Semester : VI
Subject : COMMUNICATION SYSTEMS LABORATORY
Code : EC1353
Branch : ECE

List of Experiments

1. Radiation pattern of Halfwave dipole Antenna
2. Radiation pattern of yagi Antenna
3. Radiation pattern of loop Antenna
4. Characteristics of AM receiver (Selectivity & Sensitivity)
5. Characteristics of FM receiver (Selectivity & Sensitivity)
6. Sampling & time division multiplexing
7. Pulse modulation- PAM / PWM /PPM
8. Pulse code modulation
9. Line coding & Decoding
10. Delta modulation / Differential pulse code modulation
11. Digital modulation –ASK, PSK, QPSK, FSK

Year : III
Semester : VI
Subject : NETWORKS LABORATORY
Code : EC1354
Branch : ECE

List of Experiments

1. PC to PC Communication
Parallel Communication using 8 bit parallel cable
Serial communication using RS 232C
2. Ethernet LAN protocol
To create scenario and study the performance of CSMA/CD protocol ethrol simulation
3. Token bus and token ring protocols
To create scenario and study the performance of token bus and token ring protocols through simulation
4. Wireless LAN protocols
To create scenario and study the performance of network with CSMA / CA protocol and compare with CSMA/CD protocols.
5. Implementation and study of stop and wait protocol
6. Implementation and study of Goback-N and selective ret protocols
7. Implementation of distance vector routing algorithm
8. Implementation of Link state routing algorithm
9. Implementation of Data encryption and decryption
10. Transfer of files from PC to PC using Windows / Unix socket processing

Year : III
Semester : VI
Subject : ELECTRONIC SYSTEM DESIGN LAB
Code : EC1355
Branch : ECE

List of Experiments

1. DC power supply design using buck – boost converters
Design the buck-boost converter for the given input voltage variation, load current and output voltage. Plot the regulation characteristics.

2. DC power supply design using fly back converter (Isolated type)
Design the fly back converter using ferrite core transformer for the given input voltage variation load current and output voltage.
Plot the regulation characteristics.
3. Design of a 4-20mA transmitter for a bridge type transducer.
Design the Instrumentation amplifier with the bridge type transducer (Thermistor or any resistance variation transducers) and convert the amplified voltage from the instrumentation amplifier to 4 – 20 mA current using op-amp. Plot the variation of the temperature Vs output current.
4. Design of AC/DC voltage regulator using SCR
Design a phase controlled voltage regulator using full wave rectifier and SCR, vary the conduction angle and plot the output voltage.
5. Design of process control timer
Design a sequential timer to switch on & off at least 3 relays in a particular sequence using timer IC.
6. Design of AM / FM modulator / demodulator
 - i. Design AM signal using multiplier IC for the given carrier frequency and modulation index and demodulate the AM signal using envelope detector.
 - ii. Design FM signal using VCO IC NE566 for the given carrier frequency and demodulate the same using PLL NE 565.
7. Design of Wireless data modem.
Design a FSK modulator using 555 and convert it to sine wave using filter and transmit the same using IR LED and demodulate the same PLL NE 565.
8. PCB layout design using CAD
Drawing the schematic of simple electronic circuit and design of PCB layout using CAD
9. Microcontroller based systems design
Design of microcontroller based system for simple applications like security systems combination lock etc. using 89c series flash micro controller.
10. DSP based system design
Design a DSP based system for simple applications like echo generation, etc. using TMS 320 DSP kit.

Year : IV
Semester : VII
Subject : Microwave and Optical Communication Lab
Code : EC 432
Branch : ECE

List of Experiments

MICROWAVE EXPERIMENTS

A Characteristics of Reflex Klystron Oscillator

A Characteristics of Gunn Diode Oscillator

A Study of Power distribution in Directional Coupler

A Radiation Pattern of Horn Antenna

A Frequency wavelength measurement

A Impedance measurement by slotted line method.

OPTICAL EXPERIMENTS

A DC Characteristics of LED & PIN photodiode

A Optical transmission using Analog modulation (FM)

A System Bandwidth Determination by Intensity Modulation.

A Data transmission through fiber optic cable.

A TDM

A PI Characteristics of Laser Diode.

Year : IV

Semester : VII

Subject : RF

Code : EC 440

Branch : ECE

List of Experiments

Experiments on Antenna

To plot and analyse the radiation pattern of following antennas

- a) Dipole
- b) Half wave Dipole
- c) Monopole
- d) Yagi Antenna
- e) Broadside array
- f) Endfire array
- g) Log Antenna
- h) Crossed Dipole
- i) Log Periodic Antenna
- j) Slot Antenna
- k) Helix Antenna
- l) Microstrip Antenna

II Experiments on Coaxial Line section:

- m) Measurement of a VSWR
- n) Measurement of Unknown impedance
- o) Stub Matching

III Design and Testing of RF circuits

1. RF Tuned Amplifier
2. RF Oscillator
3. RF Crystal Oscillator
4. IF Amplifier
5. RF mixer
6. RF filters (LP, HP, BP, Notch filter)