

TEACHING AND EVALUATION SCHEME

DISPLENE: ELECTRONICS & TELECOMMUNICATION ENGINEERING

SEMESTER : IV

SI. No.	Subject	Evolution Scheme							Total Marks
	Theory & Practical			Theory			Practical		
	Theory	Lecturer	Practical	End Exam	Class Test	Assignment	End Exam	Sessional	
1.	Electrical Machine	4	-	80	15	5	-	-	100
2.	Analog Electronics-II	5	-	80	15	5	-	-	100
3.	Analog & Digital Communication.	5	-	80	15	5	-	-	100
4.	Microprocessor & its Interfacing.	5	-	80	15	5	-	-	100
	Practical								
1.	Electrical Machine Lab		4	-	-	-	50	25	75
2.	Analog Electronics –II Lab		5	-	-	-	50	25	75
3.	Analog & Digital Communication Lab.		4	-	-	-	50	25	75
4.	Microprocessor & Interfacing Lab		4	-	-	-	50	25	75
5.	Soft Skill	-	3				25	25	50
	Total	19	20	320	60	20	225	125	750

ELECTRICAL MACHINE
FOURTH SEMESTER

Theory : 4 P/W
Total Theory: 60 P

Examination: 3Hr
Total Marks: 100
Theory: 80
I.A.: 15+5

A: RATIONALE:

The application of Rotatory and Static Electrical machines find extensive use in modern industries is still in practice. The Electrical machine subject is intended to provide insight of different materials and in Electrical Engineering and the concept of different Electrical Machines with their operation and control. This subject also deals with the fundamental concept of single phase and three phase AC machines.

B: OBJECTIVES;

After Completion of the Subject students will be able to:

1. Understand property & use of Electrical conducting & insulating materials.
2. Explain working principle & construction of DC generator.
3. Explain construction & working principle of motor & speed control of DC motor.
4. Discuss AC fundamentals.
5. Explain Construction & principle of transformer.
6. Describe principle of working of three-phase Induction motor.
7. Describe principle of single-phase motor.

C: TOPIC WISE DISTRIBUTION OF PERIODS.

Sl.No.	Topics	Periods
1	ELECTRICAL MATERIAL	04
2	DC GENERATOR	10
3	DC MOTOR	09
4	AC CIRCUITS	09
5	TRANSFORMER	08
6	INDUCTION MOTOR	12
7	SINGLE PHASE INDUCTION MOTOR	08
	Total	60

D: COURSE CONTENT IN TERMS OF SPECIFIC OBJECTIVES**1. ELECTRICAL MATERIAL**

Discuss properties & uses of different conducting material.

Discuss properties & use of various insulating materials used in electrical engineering.

Explain various magnetic materials & their uses.

2. DC GENERATOR

2.1 Explain construction, Principle & application of DC Generator.

2.2 Classify DC generator including voltage equation.

2.3 Derive EMF equation & simple problems.

2.4 Define parallel operation of DC generators.

3. DC MOTOR

Explain Principle of working of a DC motor.

Explain concept of development of torque & back EMF in DC motor including simple problems.

Derive equation relating to back EMF, Current, Speed and Torque equation.

Classified DC motors & explain characteristics, application.
State & explain three point & four point stator/static of DC motor by solid State converter.
Explain Speed of DC motor by field control and armature control method.
Explain power stages of DC motor & derive Efficiency of a DC motor.

4. AC CIRCUITS

State Mathematic representation of phasors, significant of operator "J".
Discuss Addition, Subtraction, Multiplication and Division of phasor quantities.
Solve AC series circuits containing resistance, capacitances, Conception of active, reactive and apparent power and Q-factor of series circuits.
Solve AC Parallel circuits containing Resistances, Inductance and Capacitances Q-factor of parallel circuits.

5. TRANSFORMER

State construction & working principle of transformer & define conection of Ideal Transformer.
Derive of EMF equation of transformer, voltage transformation ratio.
Discuss Flux, Current, EMF components of transformer and their phasor diagram under no load condition.
Discuss Phasor representation of transformer flux, current EMF primary and secondary voltages under loaded condition.
Explain types of losses in Single Phase (1- ϕ)Transformer.
Explain open circuit & short-circuit test (simple problems)
Explain Parallel operation of Transformer.

6. INDUCTION MOTOR

Explain construction feature, types of three-phase induction motor.
State principle of development of rotating magnetic field in the stator.
Establish relationship between synchronous speed, actual speed and slip of induction motor.
Establish relation between torque, rotor current and power factor.
Explain starting of an induction motor by using DOL and Star-Delta stator. State industrial use of induction motor.

7. SINGLE PHASE INDUCTION MOTOR

Explain construction features and principle of operation of capacitor type and shaded pole type of single-phase induction motor.
Explain construction & operation of AC series motor.
Concept of alternator & its application.

RECOMMENDED BOOKS:

A: TEXT BOOK:

1. Fundamental of Electrical Engg. By B.L.Theraja.
2. Principle of Electrical Engg. By Dawes Vol. I & II.

B: REFERENCE BOOK:

1. Electrical Technology by H.Cotton.
2. Electrical Machines by Dr. S.K.Bhattachary.
3. Principle of Electrical Machine V.K.Meheta & R.Meheta

ANALOG ELECTRONICS – II
FOURTH SEMESTER

Theory : 5 P/W
Total Theory: 75 P

Examination: 3Hr
Total Marks: 100
Theory: 80
I.A.: 15+5

A : RATIONALE:

This subject Analog Electronics II is the continuation subject of Analog Electronics I which deals with Analog integrated Circuits and wave shaping Circuits for various application in Electronics Engineering. The operational Amplifier will play vital role in day to day life of most of the Electronics equipment. The concept of operational Amplifier has also been incorporated in this subject.

B: OBJECTIVES:

After completing the topic, the students will able to know

- Concept of Opto Electronics.
- Concept of Operational Amplifier.
- Different Characteristics Op-Amp.
- Concept of IC Voltage Regulator.
- Idea of PCB Design.

C: TOPIC WISE DISTRIBUTION OF PERIODS :

Sl.No.	Topics	Periods
1.	OPTO ELECTRONICS	10
2.	INTEGRATED CIRCUITS	10
3.	INTRODUCTION TO OP-AMP	10
4.	INTRODUCTION TO OPERATIONAL AMPLIFIER	12
5.	APPLICATION OF IC	13
6.	IC VOLTAGE REGULATOR	10
7.	PRINTED CIRCUIT BOARD	10
TOTAL		75

D : COURSE CONTENTS IN TERMS OF SPECIFICATION:**1. OPTO ELECTRONICS.**

- 1.1 Define the concept of Photoconductivity , Photoconductivity and Photovoltaic effect.
- 1.2 Define the concept of Light emitters & light detectors.
- 1.3 Explain construction & working of LDR, LED, LCD, Phototransistor, Infrared transmitter and receiver.
- 1.4 Explain Optoisolator Application for Solid state Relay and Optointerrupters (i.e. Optical Switch)

2. INTEGRATED CIRCUITS.

- Define the term IC and its uses.
- State the different types of ICs.
- Describe the fabrication of monolithic IC.
- Discuss, the fabrication of monolithic resistors ,capacitors, diodes & bipolar junction transistors.
- Explain briefly the difference between digital & linear ICs.

3. INTRODUCTION TO OP-AMP.

Define the term differential amplifier & explain its significance.

Draw the four differential amplifier configuration and show the no of Input

signal used and the way the Output is measured voltage of each amplifier (no mathematical derivations) different types of configurations of differential amplifier.

Block diagram representation of a typical Op- Amp

Analyse a typical Op-Amp equivalent circuits and draw the schematic symbol Discuss the types of integrated circuits manufacturers designations of ICs .Package types, pin identification and temperature and ordering information, device identification and the need of two power supply for ICs.

4. INTRODUCTION TO OPERATIONAL AMPLIFIER.

Explain general information of data sheet of 741.

Define the following electrical characteristics input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate .

Define Ideal operational amplifier and its equivalent circuits.

Draw and explain the open look configuration (inverting, non-inverting)

Draw the block representation of four feedback configurations.

Draw the circuit diagram of the voltage series feedback amplifier and derive the close loop voltage gain, gain of feedback circuits input resistance, output resistance, bandwidth and total output offset voltage with feedback.

Draw the circuit diagram of the voltage shunt feedback amplifier and derive the close loop voltage gain, gain of feedback circuits, input resistance, output resistance, bandwidth and total output offset voltage with feedback.

5. APPLICATION OF IC.

- 5.1 Discuss the summing scaling and averaging of inverting and non-inverting configuration.
- 5.2 Explain the operation of instrumentation amplifier using transducer bridge
- 5.3 Discuss the integrator and differentiator using op-amp.
- 5.4 Define active filter and describe the filter design of fast order low Pass Butterworth filter.
- 5.5 Describe the filter design of fast order High Pass Butterworth filter.
- 5.6 Explain the concept of Zero-Crossing Detector using Op-Amp
- 5.7 Draw the block diagram and operation of IC 555 timer.
- 5.8 Explain the operation of Astable and Monostable multivibrator & VCO using IC555 .
- 5.9 Explain the working of Wein Bridge Oscillator using operational Amplifier.
- 5.10 Explain the Voltage to Current Convertor using Operational Amplifier.
- 5.11 Explain the Voltage to Current Conversion using Operational Amplifier.

6. IC VOLTAGE

- 6.1 Explain the operation of power supply using 78XX and 79XX
- 6.2 Draw the functional block diagram of IC regulator LM723 & LM317.
- 6.3 Explain the voltage power supply using LM317 and LM723.
- 6.4 Explain the short circuits and over voltage protection of power supply.

7. PRINTED CIRCUIT BOARD (PCB).

Discuss the different types of PCB : single sided double sided multi layer

Explain the PCB design principle (Brief description): The schematic Diagram, Layout design, Artwork, Manufacturing of film master.

Explain PCB fabrication procedure (Brief description): Cutting of PCB, Cleaning, Lamination, Exposing, Developing, Etching, Drilling, Solder Max, Tinning, Legend Printing, Finishing.

Recomonneded Books:

A: TEXT BOOK:

1. Operational Amplifier & Linear Integrated Circuit – R.K. Geakward.
2. PCB Design Technology Walter Boshart.

B: REFERENCE BOOK:

1. Introduction Electronics & Devices & Circuits by Robert.T.Paynter – Person.
2. Liner Integrated Circuit by J.B. Gupta – Katson.
3. L.M. on PCB Fabrication by NTTTF –Banglour.

ANALOG & DIGITAL COMMUNICATION
FOURTH SEMESTER

Theory : 5 P/W
Total Theory: 75 P

Examination: 3Hr
Total Marks: 100
Theory: 80
I.A.: 15+5

A: RATIONALE:

The subject Analog & Digital Communication deals with different types of Electronics Communication System includes basic process, Principle & methods of different Analog & Digital Communication System including Transmitter & Receiver. Different modulation techniques has been discussed in this subject.

B: OBJECTIVES;

On completing the topic, the students will able to know

1. Need of modulation and classify modulation.
2. Discuss modulation & balanced modulators.
3. Methods of generating SSB signal & Vestigial side band signal.
4. Principle of Frequency Division Multiplexing.
5. Principle of AM & FM demodulators.
6. Principle of AM & FM Radio transmitter & receiver using block diagram.
7. Frequency modulation & expression for frequency-modulated signal.
8. Discuss the generation and detection of PAM, PWM & PPM system.
9. Explain quantization of signal & quantization error.
10. Explain generation & demodulation of PCM system & T carrier system.
11. Explain the operation of Time Division Multiplexing.
12. Explain the generation & demodulation of Delta modulation & Adaptive Delta modulation.
13. Discuss the generation and detection of binary ASK, FSK, PSK, QPSK, QAM, MSK.
14. Explain the operation of Spread Spectrum Modulation Techniques.
15. Define the channel capacity formula

C : TOPIC WISE DISTRIBUTION OF PERIODS.

Sl.No.	Topics	Periods
1.	Analog Communication	20
2.	AM & FM receiver	15
3.	AD Conversion & Pulse Modulation	20
4.	Digital Communication	20
	TOTAL	75

D : COURSE CONTENTS IN TERMS OF SPECIFIC OBJECTIVES:**1. ANALOG COMMUNICATION.****1.1 Amplitude Modulation System**

- 1.1.1 Explain need of modulation and classify modulation.
- 1.1.2 State & explain Amplitude modulation derive the expression
For amplitude modulation signal, power relation in AM wave

& find Modulation Index..

1.1.3 Discuss modulation & balanced modulators.

1.1.4 State & explain SSB signal.

1.1.5 State methods of generating SSB signal (Indirect method & phasing method.)

1.1.6 State & explain Vestigial side band signal.

1.1.7 Discuss the concept of Multiplexing & Explain operation of Frequency Division Multiplexing.

State and explain AM demodulators (liner diode detector, square law detector & PLL)

1.2 Frequency Modulation Systems.

1.2.1 State and explain frequency modulation.

1.2.2 Derive the expression for frequency-modulated Signal & find Modulation Index.

1.2.3 Explain the frequency spectrum of FM signal.

1.2.4 State and explain phase modulation.

1.2.5 Compare between AM and FM modulation.

1.2.6 Discuss the methods of FM generation. (Parameter variation method, Armstrong method.)

1.2.7 Explain the principle of operation of FM demodulator. (Forster Seely Discriminator)

1.2.8 Explain the working principle of FM stereophonic FM transmitter.

2. AM & FM RECEIVER

2.1 State the working of super heterodyne radio receiver with block diagram.

2.2 State the working of FM Receiver with Block Diagram.

2.3 Explain the working of stereo phonics FM receiver.

2.4 State and explain the terms Selectivity, Sensitivity, Fidelity and Noise Figure .

2.5 Explain R.F amplifier mixer using transistor and I.F amplifier.

2.6 State and explain image signal selection of I.F and alignment of receiver.

3. ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM.

State and explain Sampling Theorem & Nyquist rate & classify Sampling,

Discuss the generation and detection of PAM, PWM & PPM system.

Explain quantization of signal & quantization error.

Explain generation & demodulation of PCM system.

Explain the working of T-Carrier system.

Define time division multiplexing & explain the operation of Time Division Multiplexing.

3.7 Explain the generation & demodulation of Delta modulation.

3.8 Explain the generation & demodulation of Adaptive Delta modulation.

4. DIGITAL COMMUNICATION.

4.1 State & explain Digital Communication.

4.2 State the advantages of digital communication system.

4.3 Classify digital modulation techniques.

- 4.4 Discuss the generation and detection of binary ASK, FSK,PSK, DPSK ,QPSK, QAM, MSK.
- 4.5 Explain the operation of Spread Spectrum Modulation Techniques.
- 4.6 Define the channel capacity formula.(Shannon Theorems)
- 4.7 List of Application of Different Modulation Schemes.
- 4.8 What are types of Modem & its Application.

RECOMMENDED BOOKS:

a) Text Books:

1. Electronics Communication by Sanjay Sharma.
2. Principle of Communication by A.Singh & A.K.Chabra.
3. Radio Engineering by G.K.Mithal.
4. Communication System by R.P.Singh & S.D. SAPRE.

b) Reference Books:

1. Radio Engineering by ML Gupta.
2. Electronic Communication by G.Kennedy.
3. Principle of Communication by Taub & Schilling.
4. Advanced Communication by Thomasi.

MICROPROCESSOR & ITS INTERFACING
FOURTH SEMESTER

Theory & Tutorial-5P/W
Total Theory & Tutorial: 75 P

Examination: 3Hr
Total Marks: 100
Theory: 80
I.A: 15+5

A: RATIONALE:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips.

B: OBJECTIVS:

On completion of the subject, the student will be able to:

1. The students will able to differential between 8085 microprocessor.
2. Classify Bus.
3. Describe the Architecture of 8085 microprocessor.
4. Comprehend different instructions of 8085 microprocessor.
5. State & explain addressing modes.
6. Write instructions under different addressing modes.
7. Discuss assembler.
8. Explain basic assembler directives.
9. Describe types of assembly language programs and write programs.
10. Explain the timing diagrams of different instructions.
11. State the functions of the interfacing chips like 8255, etc.
12. Explain the delay subroutine.
13. Calculate the delay in ms by one, two or three registers.
14. Explain ADC & DAC?
15. Explain the use of ADC & DAC modules
16. Write a program for traffic light control.
17. Apply Programming technique for stepper motor control.

C: TOPIC WISE DISTRIBUTION OF PERIODS:

Sl.No.	Topics	Periods
1.	INTRODUCTION.	05
2.	BASIC ARCHITECTURE OF8-BIT MICROPROCESSOR.	10
3.	INSTRUCTION SET	10
4.	PROGRAMMING TECHNIC	10
5.	TIMING DIAGRAMS	08
6.	INTERFACING I/O & MEMORY	10
7.	INTERFACING I/O PROGRAMMING	08
8.	16BIT MICROPROCESSOR	14
	TOTAL	75

D: COURSE CONTENTS IN TERM OF SPECIFIC OBJECTIVES:

1. INTRODUCTION.

- 1.1 Discuss Microprocessor.
- 1.2 Distinguish between microprocessor & microcomputer.
- 1.3 Discuss Generation of microprocessor.

2. BASIC ARCHITECTURE OF 8-BIT MICROPROCESSOR.

- 2.1 Discuss Architecture.
- 2.2 State & Explain BUS.
- 2.3 Study general Bus structure.
- 2.4 Describe address bus, data bus, control bus & System Bus.
- 2.5 Describe pin structure of 8085 Microprocessor.
- 2.6 Describe internal Architecture of 8085 Microprocessor with a Block Diagram.
- 2.7 Describe three state registers.
- 2.8 Study the data transfer using tristate registers & Concept of Multiplexing.
- 2.9 Discuss application of Arithmetic logic unit & Program Counter.
- 2.10 State & explain stack pointer, stack & stack top.
- 2.11 Define registers of 8085.
- 2.12 Distinguish between SPR & GPR.
- 2.13 Describe 8085 interrupt & interrupt Acknowledge Signal.

3. INSTRUCTION SET.

- 3.1 Explain need for addressing data.
- 3.2 Differentiate between 1-address, 2-address & 3-address instructions with examples.
- 3.3 Define addressing modes with suitable examples.
- 3.4 Explain different types of Instructions.(Data Transfer, Arithmetic,Logical, Branching, Stack& I/O Machine Control)
- 3.5 Simple Programs of 8085 Instructions.
- 3.6 Explain the basic assembler directives.

4. PROGRAMMING TECHNICIS

Write the program based on

- 4.1 Looping, Counting & Indexing.
- 4.2 Logic Operations.
- 4.3 Counters & Time delay (Single Register, Register Pair, More than Two Register)
- 4.4 Stack & Subroutines.
- 4.5 Code conversion, BCD Arithmetic & 16Bit data Operation,Block Transfer.
- 4.6 Array Handling.

5.TIMING DIAGRAMS.

- 5.1 Discuss the concept of timing diagram.
- 5.2 Differentiate between instruction cycle, machine cycle & T-state.
- 5.3 Draw op-code phase machine cycle (4 & 6 T-state) timing diagram.
- 5.4 Draw timing diagram for memory read, memory write, I/O read, I/O write machine cycle.

Draw a neat sketch for the timing diagram for 8085 instruction (MOV, DCR, MVI, LDA).

6. INTERFACING I/O & MEMORY PROGRAMMING

- 6.1 Discuss interfacing.
- 6.2 Describe the pin diagram of 8255 chip and explain function of each pin.
- 6.3 Describe internal architecture of 8255. (PPI)
- 6.4 Define Mapping & Distinguish between Memory mapping & I/O Mapping.
- 6.5 Explain Memory interfacing with RAM & EPROM.
- 6.6 Explain Functional Block Diagram 8257 DMA controller.
- 6.7 Explain Functional Block Diagram 8259 Programming Interrupt Controller.
- 6.8 Explain the functional Block Diagram 8251(USART)

7. INTERFACING I/O PROGRAMMING.

- 7.1 Describe ADC & DAC with Interfacing.
- 7.2 Interface a traffic light control system using 8255.
- 7.3 Write interfacing programme for stepper motor control.

8. 8086 MICROPROCESSOR AND INSTRUCTION SET

- 8.1 Explain the block diagram of a Microprocessor based system.
- 8.2 Explain the internal architecture of 8086-Programming model.
- 8.3 Explain pin details of 8086 / 8088.
- 8.4 To calculate the physical address of a memory location.
- 8.5 Explain flag register.
- 8.6 Explain the basic 8086 system timing diagram.
- 8.7 Explain the Instruction format-Memory addressing machine.
- 8.8 Explain minimum and maximum mode of 8086 operation.
- 8.9 Explain addressing modes of 8086.
- 8.10 Explain interrupts and vector table.
- 8.11 Compare 8086 & 8088.
- 8.12 Explain basic features of 8087 coprocessor.
- 8.13 Explain the various assembler directives of 8086.
- 8.14 Discuss instruction set-Data transfer-Arithmetic and logical-branching-loop control.& String – processor control instruction

RECOMMENDED BOOKS:

A. TEXT BOOKS:

1. Microprocessor Arch, Programming & Application by R.S. Goankar.
2. Advanced microprocessor and peripherals, programmer by A.K.Roy and K.M.Bhurchand, PHI.

B. REFERENCE BOOK:

1. Microprocessor & its application by B.Ram.
2. Microprocessor by M. Rafiquizaman, PHI
3. Introduction to Microprocessor by A.P. Mathur.
4. Microprocessor by B.P.Singh.

ELECTRICAL MACHINE LAB
FOURTH SEMESTER

Period / Week: 4
Total Contact hrs:60

End Exam.: 25
Sectional: 25
Exam. Time: 4 Hours

A: RATIONALE:

This Lab gives understanding of different Electrical Machine i.e. DC Generator, DC Motor, Transformer, etc. The students will able to identify different parts and connections and test the equipment.

B: OBJECTIVS:

On completing of this Lab. Course the students will able to

- Run the DC Generator & DC Motor.
- Connection of above Machine.
- Find the losses of Transformer & different Students.

C: COURSE CONTENT OF SPECIFIC OBJECTIVE:

1. Study different parts of DC Generator.
2. Run a DC shunt Generator and
3. Connect and run DC Motor (series, shunt and compound motor with suitable stators connections & measure speed.).
4. Study 3 point & 4 point starter.
5. Study speed Control of DC shunt motor(field and armature voltage method)
6. Parallel operation of DC generator.
7. Connect & run a 3- I.M. with the help of star-delta stator.
8. Identify the terminals of a transformer connect short circuit & open circuit test & find the losses..
9. Determine voltage regulation of transformer by direct loading.
10. Construct switch board using cut-out, switches, plugs, holder and two ways Switch.
11. Study Parallel operation of Transformer.

ANALOG ELECTRONICS LAB – II
FOURTH SEMESTER

Period / Week: 5 P/W
Total Contact hrs:75 P

End Exam.: 50
Sessional: 25
Exam. Time: 4 Hours

A: RATIONALE:

This Lab. Based on the application of Operational Amplifier & IC Voltage Regulated & PCB Design. The students will used software & Circuit maker software at the end of the section.

B: OBJECTIVS:

After Completing the Lab. The student will able to know

- The Characteristics of operational Amplifier.
- Construction of Timer Circuit.
- Construction of Power Supply IC based.
- Idea of PCB Design.

C: COURSE CONTENT OF SPECIFIC OBJECTIVE:

1. Construct and test voltage power supply using 78xx &79xx ICs
2. Construct and test voltage power supply using CM723.
3. Study of Operational Amplifier 741 & Timer IC 555.
4. Determine the following characteristics of an OP-Amp.
 - i) Input off-set voltage.
 - ii) Slew rate.
 - iii) CMMR
 - iv) Bandwidth.
 - v) Input bias current.
5. Construct and study inverting and non-inverting OPAMP.
6. Construct and study integrator and differentiator using OPAMP.
7. Construct and study voltage comparator using OPAMP.
8. Construct and study performance of Instrumentation Amplifier.
9. Construct and study timer using IC 555 (Astable & Monostable)
10. Construct and study IC 565 PLL and find range & capture range..
11. PCB Design

Mini project: After PCB design place the component and test the Electronics Circuit and prepare a report at the end of session. At the end of Semester. Drafting, Simulation & design of PCB can be carried out using the following suitable software.

- a) DC Regulator Power Supply 2A, 0-30V.
- b) Clock Display (Hr.Min.Sec.) Format.
- c) Frequency Counter
- d) Counter & Display upto 999.

*** SOFTWARE**

1. B2-Spice + Eagle : Simulation & PCB design software.
2. Supper CAD.
3. Electronics work bench: Simulation.
4. CADSTAR : PCB Design.
- 5.P Spice : Simulation
6. Edwin : Simulation + PCB design.
7. ORCAD
8. Circuit Maker & etc.

REFERENCE BOOKS:

ANALOG & DIGITAL COMMUNICATION LAB.
FOURTH SEMESTER

Period / Week: 4 P/W
Total Contact hrs:60P

End Exam.: 50
Sessional: 25
Exam. Time: 4 Hours

A: RATIONALE:

This Lab. Is the based on Communication System based on Analog & Digital Communication The students will able to test and observe various communication equipment including Transmitter & Receiver.

B: OBJECTIVE:

After Completing the Lab. Course the students will able to know

- Concept of AM transmitter & Receiver.
- Concept of FM Transmitter & Receiver.
- Concept of Digital (PCM/ASK/FSK/PSK)

C: COURSE CONTENTS IN TERM OF SPECIFIC OBJECTIVES:

1. Study of AM transmitter & Detector and observe the waveform at different test point.
2. Determine percentage of Modulation Index of AM.
3. Study of FM transmitter & Detector & observe the waveform at different section.
4. Study of SSB signal & observe the waveform at different section.
5. Study of sampling theorem & observe the waveform at different section.
6. Study of PCM transmitter & receiver & observe the waveform at different section.
7. Study of ASK modulator & demodulator & observe the waveform at different section.
8. Study of FSK modulator & demodulator & observe the waveform at different section.
9. Study of PSK modulator & demodulator & observe the waveform at different section.
10. Study of delta modulator & demodulator & observe the waveform at different section.
11. Mini project: The students will collect the detail specification and Catalog of all equipments used and submit at end of session. Perform a transmitter & receiver using array modulation system.

MICROPROCESSOR & ITS INTERFACING Lab
FOURTH SEMESTER

Period / Week: 4 P/W
Total Contact hrs:60 P

End Exam.: 25
Sessional: 25
Exam. Time: 4 Hours

A: RATIONALE:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips.

B: OBJECTIVE:

After Completing the Lab. Course the students will able to know

- The concept of Microprocessor 8085 (8Bit)
- Concept of 16 Bit Processor 8086
- Programming & Interfacing Concept

C: COURSE CONTENTS IN TERM OF SPECIFIC OBJECTIVES:.

- 3.1 Discuss microprocessor trainer kit.
- 3.2 Draw the pin & internal Architecture structure of 8085.
- 3.3 Write a program for 8-bit addition & subtraction.
- 3.4 Write a program for multi byte addition.
- 3.5 Write a program for multiplication & division of two 8-bit numbers.
- 3.6 Write a program to find the maximum value in an array.
- 3.7 Write a program for arranging the given data in ascending & descending order.
- 3.8 Write a program for BCD to Hex & ASCII to Binary & Vice Versa conversion.
- 3.9 Write a program to find the square root of a given data.
- 3.10 Write a program for generating Daley using one resistor, two resistor & three resistor.
- 3.11 Write a program for Up counter & Down counter with one second delay.
- 3.12 Write a program for interfacing using 8085.
 - a) Glowing of light (Moving) using 8255.
 - b) Display your name (4bit using 8279)
 - c) Traffic light controller
 - d) Steeper Motor Controller
 - e) DC Motor Control
 - f) 8-Bit ADC & DAC
- 3.13 Write the simple program using 8086 Microprocessor.

SOFT SKILLS
FOURTH SEMESTER

Period / Week: 3 P/W
Total Contact hrs:45 P

End Exam.: 25
Sessional: 25
Exam. Time: 4 Hours

A: RATIONALE:

The Soft Skill will provide Motivation among the students to develop new Technology Based on Advances in Electronics & Provide Guidance for Carrier Growth. The student will enhance their skills through Group Discussion & Presentation. They are communication skills with Managerial capability will be enhanced.

B: OBJECTIVE:

After Completing the Lab. Course the students will able:

To motivation the students in developing life skills for successful career growth.

C: COURSE CONTENTS IN TERM OF SPECIFIC OBJECTIVES:

A: Split of Course Content

1. Lecturer	15 hrs
On relevant new technologies	
On soft skills	
2. Group Discussions	15 hrs
3. Presentations	15 hrs
Total	45 hrs

Guidelines:

- B 1. All the above activities shall be students centred.
2. All the students shall be divided in to batches of 5 students or less.
3. Students are divided into batches for the purpose of ensuring guidance and assessment only
4. All the batches shall be divided and entrusted to among the available Students.
5. Internal faculty shall act as guides & facilitators
6. Internal assessment shall be the responsibility of the faculty members to whom the students are entrusted.
7. The faculty members shall provide all the guidance needed for the students motivate them and ensure their active participation in all above activities.
8. Lecturers shall be arranged by the students with active support of the faculty.
9. Each batch of the students shall arrange at least one lecture, One Group Discussion and One Presentation.
10. At least 75% of the lectures shall be from external experts.
11. All the students of the class shall be present during all the activities, though the initiative could be from any one of the batches.
12. For each of the activities, a single session of two hours, there can be 1 or more lecturers or group discussions or presentation,

ensuring the beneficial limits.

13. Each student shall prepare a report independently on each of the lecture / Group Discussion sessions or presentation, ensuring the beneficial limits.
14. All the presentations by the students shall be computer aided using Power Point.
15. Each of the students shall submit a copy of the presentations made by him/her to his/her guide.
16. Every student shall maintain a file of the valued reports on lecture and group discussions along with copies of the presentations made by his group.
17. During group discussions and presentations, involvement of every student in the batch shall be ensured, by allocating a part of the group discussion and presentation to each of the students in the batch.
18. External experts shall be involved during group discussions & Presentations also to the extent possible.
19. When any of these sessions are in progress all the faculty members shall be present unless there is clash of theory & practical of other semesters for them. For this purpose, if need be the tables may be re-arranged.
20. However the guide for the batch of students who have taken the initiative of any or the activities shall be present during the session without fail.
21. The guide for each batch of the batches shall observe his students with respect to all the parameters identified for marking marks for each of his students.

C For ASSESSMENT of marks the following will be taken care

Lectures:	8Marks
Initiative	
Organisational skills	
Report	
Group discussions:	7Marks
Initiative	
Debating skills	
Report	
Presentation:	10Marks
Initiative	
Presentation	
Communication skills	
TOTAL	25Marks