Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : **Digital Electronics**			
Discipline: **ET&C**		Name of the Faculty: **Sarada Prasanna Singh**	
Course Code:	**TH-2**	Semester:	**3rd**
Total Periods:	**60**	Examination:	**2023(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Number System-Binary, Octal, Decimal, Hexadecimal - Conversion from one system to another number system.
	2nd	
	3rd	Arithmetic Operation-Addition, Subtraction, Multiplication, Division, 1's & 2's complement of Binary numbers& Subtraction using complements method
	4th	
2nd	1st	Digital Code & its application & distinguish between weighted & non-weight Code, Binary codes, excess-3 and Gray codes.
	2nd	
	3rd	Logic gates: AND,OR,NOT,NAND,NOR, Exclusive-OR, Exclusive-NOR--Symbol, Function, expression, truth table & timing diagram
	4th	
3rd	1st	Universal Gates& its Realisation
	2nd	Boolean algebra, Boolean expressions, Demorgan's Theorems
	3rd	Represent Logic Expression: SOP & POS forms
	4th	Karnaugh map (3 & 4 Variables)&Minimization of logical expressions ,don't care conditions
4th	1st	Karnaugh map (3 & 4 Variables)&Minimization of logical expressions ,don't care conditions
	2nd	Half adder, Full adder, Half Subtractor, Full Subtractor, Serial and Parallel Binary 4 bit adder
	3rd	
	4th	Multiplexer (4:1), De- multiplexer (1:4), Decoder, Encoder, Digital comparator (3 Bit)
5th	1st	Seven segment Decoder (Definition, relevance, gate level of circuit Logic circuit, truth table, Applications of above)
	2nd	
	3rd	Principle of flip-flops operation, its Types
	4th	SR Flip Flop using NAND,NOR Latch (un clocked)
6th	1st	C l o c k e d SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications
	2nd	
	3rd	Concept of Racing and how it can be avoided
	4th	Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out

7th	1st	Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out
	2nd	Universal shift registers-Applications.,
	3rd	Types of Counter & applications
	4th	
8th	1st	Binary counter, Asynchronous ripple counter (UP & DOWN), Decade counter. Synchronous counter, Ring Counter.
	2nd	
	3rd	Concept of memories-RAM, ROM, static RAM, dynamic RAM,PS RAM
	4th	Basic concept of PLD & applications
9th	1st	Necessity of A/D and D/A converters
	2nd	D/A conversion using weighted resistors methods.
	3rd	D/A conversion using R-2R ladder (Weighted resistors) network.
	4th	
10th	1st	Cut off frequency, passband and stop band.
	2nd	Classify filters- low pass, high pass, band pass, band stop filters & study their Characteristics.
	3rd	A/D conversion using counter method
	4th	A/D conversion using Successive approximate method
11th	1st	Various logic families &categories according to the IC fabrication process.
	2nd	Characteristics of Digital ICs- Propagation Delay, fan-out, fan-in, Power Dissipation ,Noise Margin ,Power Supply requirement &Speed with Reference to logic families.
	3rd	
	4th	Features, circuit operation &various applications of TTL(NAND), CMOS (NAND & NOR)

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : VLSI & EMBEDDED SYSTEM			
Discipline: **ET&C**		Name of the Faculty: **Sarada Prasanna Singh**	
Course Code:	**TH-2**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2023(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Historical perspective- Introduction
	2nd	Classification of CMOS digital circuit types
	3rd	Introduction to MOS Transistor& Basic operation of MOSFET.
	4th	Structure and operation of MOSFET (n-MOS enhancement type) & COMS
2nd	1st	MOSFET V-I characteristics,
	2nd	Working of MOSFET capacitances.
	3rd	Modelling of MOS Transistors including Basic concept the SPICE level-1 models, the level-2 and level-3 model.
	4th	Flow Circuit design procedures,
3rd	1st	VLSI Design Flow & Y chart
	2nd	Design Hierarchy
	3rd	VLSI design styles-FPGA, Gate Array Design, Standard cells based, Full custom
	4th	Simplified process sequence for fabrication
4th	1st	Basic steps in Fabrication processes Flow,
	2nd	Fabrication process of nMOS Transistor
	3rd	CMOS n-well Fabrication Process Flow
	4th	MOS Fabrication process by n-well on p-substrate
5th	1st	CMOS Fabrication process by P-well on n-substrate
	2nd	Layout Design rules
	3rd	Stick Diagrams of CMOS inverter
	4th	Basic nMOS inverters, Working of Resistive-load Inverter,
6th	1st	Inverter with n-Type MOSFET Load – Enhancement Load, Depletion n-MOS inverter
	2nd	CMOS inverter – circuit operation and characteristics and interconnect effects: Delay time definitions
	3rd	CMOS Inventor design with delay constraints – Two sample mask lay out for p-type substrate.
	4th	Define Static Combinational logic ,working of Static CMOS logic circuits (Two-input NAND Gate)

7th	1st	CMOS logic circuits (NAND2 Gate)
	2nd	CMOS Transmission Gates(Pass gate),
	3rd	Complex Logic Circuits - Basics
	4th	Classification of Logic circuits based on their temporal behaviour
8th	1st	SR Flip latch Circuit
	2nd	Clocked SR latch only.
	3rd	CMOS D latch.
	4th	Basic principles of Dynamic Pass Transistor Circuits
9th	1st	Dynamic RAM, SRAM,
	2nd	Flash memory
	3rd	Design Language (SPL & HDL)& HDL & EDA tools & VHDL and packages Xlinx
	4th	Design strategies & concept of FPGA with standard cell based design
10th	1st	VHDL for design synthesis using CPLD or FPGA
	2nd	Raspberry Pi - Basic idea.
	3rd	Embedded Systems Overview,list of embedded systems,characteristics ,example – A Digital Camera
	4th	Embedded Systems Technologies--Technology – Definition -Technology for Embedded Systems -Processor Technology -IC Technology.
11th	1st	Design Technology-Processor Technology,General Purpose Processors – Software, Basic Architecture of Single Purpose Processors – Hardware.
	2nd	Application – Specific Processors,Microcontrollers,Digital Signal Processors(DSP)
	3rd	IC Technology- Full Custom / VLSI,Semi-Custom ASIC (Gate Array & Standard Cell), PLD (Programmable Logic Device)
	4th	Basic idea of Arduino micro controller

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : WAVE PROPAGATION & BROADBAND COMMUNICATION ENGINEERING			
Discipline: **ET&C**		Name of the Faculty: **prabhakar nayak**	
Course Code:	**TH-2**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2023(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only)
	2nd	Classification based on Modes of Propagation-Ground wave, Ionosphere ,Sky wave propagation, Space wave propagation
	3rd	Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height
	4th	Radiation mechanism of an antenna-Maxwell equation.
2nd	1st	Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern
	2nd	
	3rd	Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only b) UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna
	4th	
3rd	1st	Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna
	2nd	Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
	3rd	Fundamentals of transmission line
	4th	Equivalent circuit of transmission line & RF equivalent circuit
4th	1st	Characteristics impedance, methods of calculations & simple numerical.,
	2nd	Losses in transmission line.
	3rd	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.
	4th	Quarter wave & half wavelength line
5th	1st	Impedance matching & Stubs – single & double
	2nd	Primary & secondary constant of X-mission line.
	3rd	Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
	4th	TV Transmitter – Block diagram & function of each block
6th	1st	Monochrome TV Receiver -Block diagram & function of each block.
	2nd	Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals)
	3rd	Types of Televisions by Technology- cathode-ray tube TVs, Plasma

		Display Panels, Digital Light Processing (DLP),Liquid Crystal Display (LCD),Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application
	4th	Discuss the principle of operation - LCD display, Large Screen Display
7th	1st	CATV systems & Types & networks
	2nd	Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
	3rd	Define Microwave Wave Guides
	4th	Operation of rectangular wave gives and its advantage.
8th	1st	Propagation of EM wave through wave guide with TE & TM modes.
	2nd	Circular wave guide
	3rd	Operational Cavity resonator.
	4th	Working of Directional coupler, Isolators & Circulator.
9th	1st	Microwave tubes-Principle of operational of two Cavity Klystron.
	2nd	Principle of Operations of Travelling Wave Tubes
	3rd	Principle of Operations of Cyclotron
	4th	Principle of Operations of Tunnel Diode & Gunn diode
10th	1st	Broadband communication system-Fundamental of Components and Network architecture
	2nd	
	3rd	Cable broadband data network- architecture, importance & future of broadband telecommunication internet based network.
	4th	
11th	1st	SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages
	2nd	
	3rd	ISDN - ISDN Devices interfaces, services, Architecture, applications,
	4th	BISDN -interfaces & Terminals, protocol architecture applications

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : ANALOG & DIGITAL COMMUNICATION			
Discipline: **ET&C**		Name of the Faculty: **prabhakar nayak**	
Course Code:	**TH-2**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2023(Winter)**
Theory Periods:	5P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Communication Process- Concept of Elements of Communication System & its Block diagram
	2nd	Source of information & Communication Channels
	3rd	Classification of Communication systems (Line & Wireless or Radio)
	4th	Modulation Process, Need of modulation and classify modulation process
	5th	Analog and Digital Signals & its conversion
2nd	1st	Basic concept of Signals & Signals classification (Analog and Digital)
	2nd	Bandwidth limitation.
	3rd	Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	4th	
	5th	Generation of Amplitude Modulation(AM)- Linear level AM modulation only
3rd	1st	Demodulation of AM waves (liner diode detector, square law detector & PLL)
	2nd	Explain SSB signal and DSBSC signal
	3rd	Methods of generating & detection SSB-SC signal (Indirect method only)
	4th	Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	5th	Concept of Balanced modulators
4th	1st	Vestigial Side Band Modulation
	2nd	Concept of Angle modulation & its types (PM & FM)
	3rd	Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal
	4th	Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal
	5th	Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram
5th	1st	Compare between AM and FM modulation (Advantages & Disadvantages)
	2nd	Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram

	3rd	Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
	4th	Classification of Radio Receivers,
	5th	Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure
6th	1st	AM transmitter - working principle with Block Diagram
	2nd	Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio
	3rd	Working of super heterodyne radio receiver with Block diagram
	4th	Working of FM Transmitter & Receiver with Block Diagram.
	5th	Concept of Sampling Theorem , Nyquist rate & Aliasing
7th	1st	Sampling Techniques (Instantaneous, Natural, Flat Top)
	2nd	Analog Pulse Modulation - Generation and detection of PAM, PWM & PPM system with the help of Block diagram & comparison of all above.
	3rd	
	4th	Concept of Quantization of signal & Quantization error.
	5th	Generation & Demodulation of PCM system with Block diagram & its applications.
8th	1st	Companding in PCM & Vocoder
	2nd	Time Division Multiplexing & explain the operation with circuit diagram.
	3rd	Generation & demodulation of Delta modulation with Block diagram
	4th	Generation & demodulation of DPCM with Block diagram.
	5th	Comparison between PCM, DM , ADM & DPCM
9th	1st	Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	2nd	
	3rd	Advantages of digital communication system over Analog system
	4th	Digital modulation techniques & types
	5th	
10th	1st	Generation and Detection of binary ASK, FSK, PSK, QPSK, QAM, MSK, GMSK
	2nd	
	3rd	Working of T1-Carrier system.
	4th	
	5th	Spread Spectrum & its applications
11th	1st	Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS)
	2nd	
	3rd	Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)
	4th	Application of Different Modulation Schemes.
	5th	Types of Modem & its Application

Gandhi Polytechnic, Berhampur

Department of ELECTRICAL Engineering

Lesson Plan

Subject : DIGITAL ELECTRONICS & MICROPROCESSOR			
Discipline: **ELECTRICAL**		Name of the Faculty: **Sarada Prasanna Singh**	
Course Code:	**TH-2**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2023(Winter)**
Theory Periods:	5P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Binary, Octal, Hexadecimal number systems and compare with Decimal system.
	2nd	Binary addition, subtraction, Multiplication and Division
	3rd	1's complement and 2's complement numbers for a binary number
	4th	Subtraction of binary numbers in 2's complement method.
	5th	Use of weighted and Un-weighted codes & write Binary equivalent number for a number in 8421, Excess-3 and Gray Code and vice-versa.
2nd	1st	Importance of parity Bit.
	2nd	Logic Gates: AND, OR, NOT, NAND, NOR and EX-OR gates with truth table.
	3rd	1.8 Realize AND, OR, NOT operations using NAND, NOR gates. .
	4th	1.9 Different postulates and De-Morgan's theorems in Boolean algebra.
	5th	1.10 Use Of Boolean Algebra For Simplification Of Logic Expression
3rd	1st	1.11 Karnaugh Map For 2,3,4 Variable, Simplification Of SOP And POS Logic Expression Using K-Map
	2nd	2.1 Give the concept of combinational logic circuits.
	3rd	2.2 Half adder circuit and verify its functionality using truth table.
	4th	2.3 Realize a Half-adder using NAND gates only and NOR gates only.
	5th	2.4 Full adder circuit and explain its operation with truth table.
4th	1st	2.5 Realize full-adder using two Half-adders and an OR – gate and write truth table
	2nd	2.6 Full subtractor circuit and explain its operation with truth table.
	3rd	2.7 Operation of 4 X 1 Multiplexers and 1 X 4 demultiplexer
	4th	2.8 Working of Binary-Decimal Encoder & 3 X 8 Decoder.
	5th	2.9 Working of Two bit magnitude comparator
5th	1st	3.1 Give the idea of Sequential logic circuits.
	2nd	3.2 State the necessity of clock and give the concept of level clocking and edge triggering,

	3rd	3.3 Clocked SR flip flop with preset and clear inputs.
	4th	3.5 Construct level clocked JK flip flop using S-R flip-flop and explain with truth table
	5th	3.6 Concept of race around condition and study of master slave JK flip flop.
6th	1st	3.7 Give the truth tables of edge triggered D and T flip flops and draw their symbols.
	2nd	3.8 Applications of flip flops.
	3rd	3.9 Define modulus of a counter
	4th	3.10 4-bit asynchronous counter and its timing diagram.
	5th	3.11 Asynchronous decade counter.
7th	1st	3.12 4-bit synchronous counter.
	2nd	3.13 Distinguish between synchronous and asynchronous counters.
	3rd	3.14 State the need for a Register and list the four types of registers.
	4th	3.15 Working of SISO, SIPO, PISO, PIPO Register with truth table using flip flop
	5th	4.1 Introduction to Microprocessors, Microcomputers
8th	1st	4.2 Architecture of Intel 8085A Microprocessor and description of each block.
	2nd	4.3 Pin diagram and description.
	3rd	4.4 Stack, Stack pointer & stack top
	4th	4.5 Interrupts
	5th	4.6 Opcode & Operand,
9th	1st	4.7 Differentiate between one byte, two byte & three byte instruction with example.
	2nd	4.8 Instruction set of 8085 example
	3rd	4.9 Addressing mode
	4th	4 .10 Fetch Cycle, Machine Cycle, Instruction Cycle, T-State
	5th	4.11 Timing Diagram for memory read, memory write, I/O read, I/O write
10th	1st	4.12 Timing Diagram for 8085 instruction
	2nd	4.13 Counter and time delay.
	3rd	4. 14 Simple assembly language programming of 8085
	4th	5.1 Basic Interfacing Concepts, Memory mapping & I/O mapping
	5th	
11th	1st	5.2 Functional block diagram and description of each block of Programmable peripheral interface Intel 8255 ,
	2nd	
	3rd	5.3 Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller
	4th	
	5th	

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : DATA COMMUNICATION & COMPUTER NETWORK			
Discipline: **E&TC**		Name of the Faculty: **prabhakar nayak**	
Course Code:	**TH-2**	Semester:	**4th**
Total Periods:	**60**	Examination:	**2023(summer)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	1.1 Data Communication
	2nd	1.2 Networks
	3rd	1.3 protocol& architecture,standard,osi, tcp/ip.
	4th	2.1 Data transmission Concepts and Terminology
2nd	1st	2.2 Analog and Digital Data transmission
	2nd	2.3 Transmission impairments, Channel capacity.
	3rd	2.4 Transmission media, Guided Transmission, Wireless Transmission
	4th	3.1 Data encoding
3rd	1st	3.2 Digital data digital signals
	2nd	3.3 Digital data analog signals
	3rd	3.4 Analog data digital signals
	4th	3.5 Analog data analog signals
4th	1st	4.1 Asynchronous and Synchronous Transmission
	2nd	4.2 Error Detection
	3rd	4.3 Line configuration
	4th	4.4 Flow Control,
5th	1st	4.5 Error Control
	2nd	4.6 Multiplexing
	3rd	4.7 FDM synchronous TDM
	4th	4.8 Statistical TDM
6th	1st	5.1 Circuit Switching networks
	2nd	5.2 Packet Switching principles
	3rd	5.3 X.25
	4th	5.4 Routing in Packet switching
7th	1st	5.5 Congestion.
	2nd	5.6 Effects of congestion, congestion control
	3rd	5.7 Traffic Management
	4th	5.8 Congestion Control in Packet Switching Network. flip flop
	1st	6.1. Topology and Transmission Media.

8th	2nd	6.2 LAN protocol architecture
	3rd	6.3. Medium Access control
	4th	6.4 Bridges, Hub, Switch
9th	1st	6.5 Ethernet (CSMA/CD), Fiber Channel
	2nd	6.6 Wireless LAN Technology..
	3rd	7.1 TCP/IP Protocol Suite
	4th	7.2 Basic Protocol functions
	5th	7.3 Principles of Internetworking
10th	1st	7.4 Internet Protocol operations
	2nd	7.5 Internet Protocol

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : MICROPROCESSOR & MICROCONTROLLER			
Discipline: **E&TC**		Name of the Faculty: **Sarada Prasanna Singh**	
Course Code:	**TH-3**	Semester:	**4th**
Total Periods:	**60**	Examination:	**2023(summer)**
Theory Periods:	5P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	1.1 Introduction to Microprocessor and Microcomputer & distinguish between them.
	2nd	1.2 Concept of Address bus, Data bus, Control bus & System Bus
	3rd	1.3 General Bus structure Block diagram.
	4th	1.4 Basic Architecture of 8085 (8 bit) Microprocessor
	5th	1.5 Signal Description (Pin diagram) of 8085 Microprocessor
2nd	1st	1.6 Register Organizations, Distinguish between SPR & GPR, Timing & Control Module
	2nd	1.7 Stack, Stack pointer &Stack top.
	3rd	1.8 Interrupts:-8085 Interrupts, Masking of Interrupt (SIM, RIM).
	4th	2.1 Addressing data & Differentiate between one-byte, two-byte &three-byte instructions with examples.
	5th	2.2 Addressing modes in instructions with suitable examples.
3rd	1st	2.3 Instruction Set of 8085(Data Transfer, Arithmetic, Logical, Branching, Stack& I/O , Machine Control)
	2nd	2.4 Simple Assembly Language Programming of 8085 2.4.1 Simple Addition & Subtraction
	3rd	2.4.2 Logic Operations (AND, OR, Complement 1's & 2's) & Masking of bits
	4th	2.4.3 Counters & Time delay (Single Register, Register Pair, More than Two Register)
	5th	2.4.4 Looping, Counting & Indexing (Call/JMP etc).
4th	1st	2.4.5 Stack & Subroutine programes
	2nd	2.4.6 Code conversion, BCD Arithmetic & 16 Bit data Operation, Block Transfer.
	3rd	2.4.7 Compare between two numbers
	4th	2.4.8 Array Handling (Largest number & smallest number in the array)
	5th	2.5 Memory & I/O Addressing,
5th	1st	3.1 Define opcode, operand, T-State, Fetch cycle, Machine Cycle, Instruction cycle & discuss the concept of timing diagram.
	2nd	3.2 Draw timing diagram for memory read, memory write, I/O read, I/O write machine cycle
	3rd	3.3 Draw a neat sketch for the timing diagram for 8085 instruction (MOV, MVI, LDA instruction).
	4th	4.1 Concept of interfacing

	5th	4.2 Define Mapping &Data transfer mechanisms - Memory mapping & I/O Mapping
6th	1st	4.3 Concept of Memory Interfacing:- Interfacing EPROM & RAM Memories
	2nd	4.4 Concept of Address decoding for I/O devices
	3rd	4.5 Programmable Peripheral Interface: 8255
	4th	4.6 ADC & DAC with Interfacing.
	5th	4.7 Interfacing Seven Segment Displays
7th	1st	4.8 Generate square waves on all lines of 8255
	2nd	4.9 Design Interface a traffic light control system using 8255.
	3rd	4.10 Design interface for stepper motor control using 8255.
	4th	4.11 Basic concept of other Interfacing DMA controller,USART
	5th	5.1 Register Organisation of 8086
8th	1st	5.2 Internal architecture of 8086
	2nd	5.3 Signal Descriptionof 8086
	3rd	5.4 General Bus Operation& Physical Memory Organisation
	4th	5.5 MinimumMode&Timings,
	5th	5.6 Maximum Mode&Timings
9th	1st	5.7 Interrupts and Interrupt Service Routines, Interrupt Cycle, Non-Maskable Interrupt, Maskable Interrupt
	2nd	5.8 8086 Instruction Set & Programming: Addressing Modes, Instruction Set, Assembler Directives and Operators,
	3rd	5.9 Simple Assembly language programmingusing 8086 instructions.
	4th	6.1 Distinguish between Microprocessor & Microcontroller
	5th	6.2 8 bit & 16 bit microcontroller
10th	1st	6.3 CISC & RISC processor
	2nd	6.4 Architectureof8051Micro controller
	3rd	6.5 Signal Descriptionof8051Microcontrollers
	4th	6.6 Memory Organisation-RAM structure, SFR
	5th	
11th	1st	6.7 Registers,timers,interrupts of8051 Microcontrollers. 6.8 Addressing Modes of 8051
	2nd	
	3rd	6.9 Simple 8051 Assembly Language ProgrammingArithmetic & Logic Instructions , JUMP, LOOP, CALL Instructions, I/O Port Programming
	4th	6.10 Interrupts, Timer & Counters 6.11 Serial Communication
	5th	6.12 Microcontroller Interrupts and Interfacing to 8255

Gandhi Polytechnic, Berhampur

Department of E&TC Engineering

Lesson Plan

Subject : ANALOG ELECTRONICS & LINEAR IC			
Discipline: **E&TC**		Name of the Faculty: **prabhakar nayak**	
Course Code:	**TH-4**	Semester:	**4th**
Total Periods:	**60**	Examination:	**2023(summer)**
Theory Periods:	5P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	1.1 Working principle, of Diode & its current equation, Specification and use of p-n junction diode.
	2nd	1.2 Breakdown of diode (Avlance&Zener Breakdown) and Construction, working, Characteristics
	3rd	1.3 Classification of Rectifiers and working of different types of Rectifiers- Half-Wave Rectifier, Full-Wave Rectifier (CT & BRIDGE type)
	4th	
	5th	1.4 Working principle of p-n-p and n-p-n transistor, different types of transistor connection (CB, CE and CC)& input and output characteristics of transistor in different connections
2nd	1st	1.5 Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them.
	2nd	1.6 Basic concept of Biasing, Types of Biasing,h-parameter model of BJT,load line (AC &DC) and determine the Q-point.
	3rd	1.7 Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled Amplifier & draw the curve.
	4th	2.1 Classify Power Amplifier &Differentiate between Voltage and Power Amplifier
	5th	2.2 Working principle of different types of Power Amplifier (Class-A, Class-AB, Class-B and Class-C & Class D amplifier).
3rd	1st	2.3 Construction and working principle and advantages of Push Pull (Class-B) Amplifiers
	2nd	3.1 FET & its classifications &Differentiate between JFET & BJT
	3rd	3.2 Construction, working principle & characteristics of JEFT &Explain JEFT as an amplifier, parameters of JFET & Establish relation among JFET parameters.
	4th	
	5th	3.3 Construction & working principle MOSFET & its classification & characteristics (Drain & Transfer)
4th	1st	3.4 Explain the operation of CMOS, VMOS & LDMOS.
	2nd	4.1 Define & classify Feedback Amplifier, principle of negative feedback with the help of block diagram, Types of feedback – negative &positive feedback.
	3rd	
	4th	4.2 Types of negative feedback – voltage shunt, voltage series, current shunt& current series and characteristics voltage gain, bandwidth , input Impedance output impedance, stability, noise , distortion in amplifiers.
	5th	
5th	1st	4.3 Oscillator -block diagram of sine wave oscillator ,Types Requirement of oscillationBarkhausen criterion
	2nd	4.4 RC oscillators – RC phase shift ,Crystal, LC oscillators – Colpitts , Hartley & Wien Bridge Oscillators :Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability

	3rd	5.1 Defined and classify Tuned amplifier, Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance.
	4th	5.2 working principle of Single tuned Voltage& Double tuned Amplifier & its limitation
	5th	5.3 Different type of Non-linear circuits - Clipper, diode series &shunt, positive& negative biased & unbiased and combinational clipper clippers circuit & its application.
6th	1st	5.4 Different type of Clamper circuit (positive & negative clampers) & its application.
	2nd	5.5 Working of Astable, Monostable & BistableMultivibrator with circuit diagram.
	3rd	5.6 Working& use of Integrator and Differentiator circuit using R- C circuit(Linear), input / output waveforms & frequency response.
	4th	
	5th	6.1 Differential amplifier & explain its configuration &significance.
7th	1st	6.2 Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic symbol
	2nd	6.3 Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information
	3rd	
	4th	6.4 Define the following electrical characteristics input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate .
	5th	
8th	1st	6.5 Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier)
	2nd	6.6 Draw the circuit diagram of the voltage series feedback amplifier and derive the close loop Voltage gain, gain of feedback circuits input resistance, and output resistance, bandwidth and total output offset voltage with feedback.
	3rd	
	4th	6.7 Draw the circuit diagram of the voltage shunt feedback amplifier and derive the close loop, Voltage gain, gain of feedback circuits and input resistance, and output resistance, bandwidth and total output offset voltage with feedback.
	5th	
9th	1st	7.1 Discuss the summing scaling and averaging of inverting and non-inverting amplifiers
	2nd	7.2 DC & AC Amplifies using OP-AMP.
	3rd	7.3 Integrator and differentiator using op-amp.
	4th	7.4 Active filter and describe the filter design of fast order low Pass Butterworth
	5th	7.5 Concept of Zero-Crossing Detector using Op-Amp
10th	1st	7.6 Block diagram and operation of IC 555 timer &IC 565 PLL& its applications.
	2nd	7.7 Working of Current to voltage Convertor using Operational Amplifier
	3rd	7.8 Working of the Voltage to Frequency Convertor using Operational Amplifier.
	4th	7.9 Working of the Frequency to Voltage Conversion using Operational Amplifier
	5th	
11th	1st	7.10 Operation of power supply using 78XX and 79XX,LM 317 Series with their PIN configuration
	2nd	
	3rd	
	4th	7.11 Functional block diagram & Working of IC regulator LM 723 & LM 317
	5th	

Gandhi Polytechnic, Berhampur

Department of ELECTRICAL Engineering

Lesson Plan

Subject : Analog Electronics and OP-AMP			
Discipline: **ELECTRICAL**		Name of the Faculty: **prabhakar nayak**	
Course Code:	**TH-2**	Semester:	**4th**
Total Periods:	**60**	Examination:	**2023(summer)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Pn junction diode working, construction, v-I characteristic.
	2nd	
	3rd	
	4th	DC load line
2nd	1st	Important terms such as Ideal Diode, Knee voltage
	2nd	Junctions break down. 1.6.1 Zener breakdown 1.6.2 Avalanche breakdown
	3rd	P-N Diode clipping Circuit.
	4th	P-N Diode clamping Circuit
3rd	1st	Thermistors, Sensors & barretters
	2nd	Zener Diode
	3rd	Tunnel Diode
	4th	PIN Diode
4th	1st	Classification of rectifiers
	2nd	Analysis of half wave, full wave centre tapped and Bridge rectifiers and calculate: 3.2.1 DC output current and voltage 3.2.2 RMS output current and voltage 3.2.3 Rectifier efficiency 3.2.4 Ripple factor 3.2.5 Regulation 3.2.6 Transformer utilization factor 3.2.7 Peak inverse voltage
	3rd	
	4th	
5th	1st	3.3 Filters: 3.3.1 Shunt capacitor filter 3.3.2 Choke input filter 3.3.3 π filter
	2nd	
	3rd	
	4th	
6th	1st	Principle of Bipolar junction transistor
	2nd	Different modes of operation of transistor
	3rd	Current components in a transistor
	4th	Transistor as an amplifier
7th	1st	Transistor circuit configuration & its characteristics 4.5.1 CB Configuration 4.5.2 CE Configuration 4.5.3 CC Configuration
	2nd	
	3rd	
	4th	

8th	1st	5.1 Transistor biasing 5.2 Stabilization 5.3 Stability factor 5.4 Different method of Transistors Biasing 5.4.1 Base resistor method 5.4.2 Collector to base bias 5.4.3 Self bias or voltage divider method
	2nd	
	3rd	6.1 Practical circuit of transistor amplifier 6.2 DC load line and DC equivalent circuit 6.3 AC load line and AC equivalent circuit 6.4 Calculation of gain
	4th	
9th	1st	6.5 Phase reversal 6.6 H-parameters of transistors 6.7 Simplified H-parameters of transistors
	2nd	
	3rd	6.8 Generalised approximate model 6.9 Analysis of CB, CE, CC amplifier using generalised approximate model 6.10 Multi stage transistor amplifier
	4th	
10th	1st	6.10.1 R.C. coupled amplifier 6.10.2 Transformer coupled amplifier
	2nd	6.11 Feed back in amplifier 6.11.1 General theory of feed back
	3rd	6.11.2 Negative feedback circuit 6.11.3 Advantage of negative feed back 6.12 Power amplifier and its classification 6.12.1 Difference between voltage amplifier and power amplifier
	4th	
11th	1st	6.12.2 Transformer coupled class A power amplifier 6.12.3 Class A push – pull amplifier 6.12.4 Class B push – pull amplifier
	2nd	6.13 Oscillators 6.13.1 Types of oscillators 6.13.2 Essentials of transistor oscillator
	3rd	6.13.3 Principle of operation of tuned collector, Hartley, colpitt, phase shift, weinbridge oscillator (no mathematical derivations)
	4th	7.1 Classification of FET 7.2 Advantages of FET over BJT 7.3 Principle of operation of BJT
12th	1st	7.4 FET parameters (no mathematical derivation) 7.4.1 DC drain resistance 7.4.2 AC drain resistance 7.4.3 Trans-conductance 7.5 Biasing of FET
	2nd	8.1 General circuit simple of OP-AMP and IC – CA – 741 OP AMP 8.2 Operational amplifier stages 8.3 Equivalent circuit of operational amplifier 8.4 Open loop OP-AMP configuration
	3rd	8.5 OPAMP with fed back 8.6 Inverting OP-AMP 8.7 Non inverting OP-AMP 8.8 Voltage follower & buffer
	4th	8.9 Differential amplifier 8.9.1 Adder or summing amplifier 8.9.2 Sub tractor 8.9.3 Integrator 8.9.4 Differentiator 8.9.5 Comparator