

UTKALMANI GOPABANDHU INSTITUTE OF
ENGINEERING, ROURKELA



LESSON PLAN

SESSION: 2023-2024

DEPARTMENT OF ELECTRONICS AND
TELECOMMUNICATION ENGINEERING

SUBJECT CODE: TH.4
NAME OF THE SUBJECT: ANALOG ELECTRONICS & LINEAR IC
BRANCH: ELECTRONICS & TELECOMMUNICATION
SEMESTER: 4TH
NUMBER OF CLASSES ALLOTTED PER WEEK : 5
TOTAL PERIODS ALLOTTED TO THE SUBJECT ACCORDING TO SCTEVT: 75
NAME OF THE FACULTY: KAMALA KANTA NATH

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SUBJECT CODE:	TH.4
NAME OF THE SUBJECT :	ANALOG ELECTRONICS & LINEAR IC
BRANCH:	ELECTRONICS & TELECOMMUNICATION
SEMESTER:	DIPLOMA 4TH SEM
PERIODS PER WEEK:	5 (16/01/2024 to 26/04/2024)

Week/Date	Lecture	Topic to be covered
1 st week	1 st	UNIT-1: DIODE, TRANSISTOR AND CIRCUIT Working Principle of diode and current Equation, Specifications and use of PN junction diode, Construction of diode
	2 nd	Breakdown of diode, , Working of diode, Characteristic of diode
	3 rd	Classification of rectifier, Half wave rectifier
	4 th	Full wave centered tap rectifier
	5 th	Full wave bridge type rectifier
2 nd week	1 st	Working principle of p-n-p and n-p-n transistor,
	2 nd	Different types of transistor connection (CB, CE and CC)& input and output characteristics of transistor in different connections.
	3 rd	Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them.
	4 th	Load line (AC &DC) and determine the Q-point.
	5 th	Basic concept of Biasing, Types of Biasing,
3 rd week	1 st	h-parameter model of BJT,
	2 nd	Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses
	3 rd	Unit-2: AUDIO POWER AMPLIFIERS. Classify Power Amplifier & Differentiate between Voltage and Power Amplifier.
	4 th	Working principle of Class A Power Amplifier
	5 th	Working principle of Class B Power Amplifier
4 th week	1 st	Working principle of Class C Power Amplifier
	2 nd	Working principle of Class D Power Amplifier
	3 rd	Working principle of Class AB Power Amplifier

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5 th week	1 st	Working of Class B push pull amplifier
	2 nd	Unit-3: FIELD EFFECT TRANSISTOR (FET). FET & its classifications & Differentiate between JFET & BJT.
	3 rd	Construction, working principle of N channel JFET and P channel JFET
	4 th	characteristics of JEFT
	5 th	Explain JEFT as an amplifier,
6 th week	1 st	Parameters of JFET & Establish relation among JFET parameters
	2 nd	Construction & its classification MOSFET
	3 rd	Working principle of MOSFET
	4 th	Characteristics (Drain & Transfer) of MOSFET
	5 th	Explain the operation of CMOS,
7 th week	1 st	Explain the operation of VMOS,
	2 nd	Explain the operation of LD MOS,
	3 rd	Unit-4: FEED BACK AMPLIFIER & OSCILLATOR Define & classify Feedback Amplifier, Types of feedback – negative & positive feedback.
	4 th	Types of negative feedback – voltage shunt, voltage series,
8 th week	1 st	Types of negative feedback – current shunt, current series.
	2 nd	Characteristics voltage gain, bandwidth , input Impedance output impedance, stability, noise , distortion in amplifiers.
	3 rd	Oscillator -block diagram of sine wave oscillator
	4 th	Types Requirement of oscillation- Barkhausen criterion

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9 th week	1 st	Operation of RC phase shift oscillators ,Crystal oscillators,
	2 nd	Operation LC oscillators & Colpitts oscillators
	3 rd	Operation Hartley oscillators & Wien Bridge Oscillators
	4 th	Unit-5: TUNED AMPLIFIER & WAVE SHAPING CIRCUIT. Defined and classify Tuned amplifier,
10 th week	1 st	Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance.
	2 nd	Working principle of Single tuned Voltage& its limitation
	3 rd	Working principle of Double tuned Voltage& its limitation
	4 th	Diode series &shunt Clipper
	5 th	Biased & unbiased Clipper
11 th week	1 st	Combinational clipper
	2 nd	Clamper circuit (positive & negative clampers) & its application.
	3 rd	Working of Astable, Multivibrator with circuit diagram.
	4 th	Working of Monostable Multivibrator with circuit diagram.
	5 th	Working of Bistable Multivibrator with circuit diagram.
12 th week	1 st	Working& use of Integrator and Differentiator circuit using R- C circuit
	2 nd	Unit-6: OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS Differential amplifier & explain its configuration &significance.
	3 rd	Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic symbol
	4 th	Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information.

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13th week	1 st	Define the following electrical characteristics input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate
	2 nd	Explain the Open Loop configuration of non-inverting Amplifier. Explain the Open Loop configuration of inverting Amplifier
	3 rd	Voltage series feedback amplifier and derive the close loop Voltage gain . Gain of series feedback circuits input resistance, and output resistance, bandwidth and total output offset voltage with feedback
	4 th	Voltage shunt feedback amplifier and derive the close loop, Voltage gain, Gain of shunt feedback circuits and input resistance, and output resistance, bandwidth and total output offset voltage with feedback.
	5 th	Unit-7. APPLICATION OF OPERATIONAL AMPLIFIER, TIMER CIRCUITS& IC voltage regulator summing scaling and averaging of inverting and non-inverting amplifiers
14th week	1 st	DC & AC Amplifies using OP-AMP. Integrator and differentiator using op-amp.
	2 nd	Active filter and describe the filter design of fast order low Pass Butterworth, Concept of Zero-Crossing Detector using Op-Amp
	3 rd	Block diagram and operation of IC 555 timer & IC 565 PLL& its applications
	4 th	Working of Current to voltage and Voltage to Frequency and Frequency to Voltage Converter using Operational Amplifier
15th Week	1 st	Operation of power supply using 78XX and 79XX, LM 317 Series with their PIN configuration ,
	2 nd	Functional block diagram & Working of IC regulator LM 723 & LM 317