

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Jasmin Sahu, Lecturer in AE&I

Academic Session- 2024-2025(Winter-2024)

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THE DEPARTMENT:-

To produce efficient professional in applied electronics & instrumentation engineering and other allied area's with update technical knowledge to meet the challenges of society in relevant sector.

MISSION OF THE DEPARTMENT:-

- To provide the student competent in applied electronics and instrumentation engineering with societal, environmental and human values through quality education, training.
- Provide knowledge of basic science, applied mathematics, instrumentation technology and communicative skills to identify and solve problems related to Applied Electronics and Instrumentation engineering.
- To enable the students to acquire various parameter measurement and automatic control technology used for industrial automation and inculcate quality of leadership, mentorship & teamwork in collaboration with parents, alumni & industry.

PROGRAMME EDUCATIONAL OBJECTIVES:

- To provide students with a solid foundation in basic science, electrical, electronics, instrumentation and interdisciplinary subjects that is necessary to excel in professional career, entrepreneur in future and/or higher education.
- To prepare students to meet the needs and face the challenges of real life as well as industry automation and digitalization in terms of technical, economic and social feasibility.
- To inculcate professionalism, communication skills, attitudes, team work and to adapt to the current trends by engaging in lifelong learning.
- To utilize the technology in domestic, medical, industry and community for proper utilization of instrument for measurement & control.

Discipline: Applied Electronics & Instrumentation Engineering.	Semester : 5 TH		Name of the teaching faculty: Jasmin Sahu
Subject: Linear Integrated Circuit and application(Th-4)	No. of Days/per week class allotted: 05 periods/per week (MON ,TUE , THU-01 period & FRI:- 2 Period)		Semester From Date:- 22-07-2024 To Date:- 08-11-2024 No. of weeks: 14 weeks
Week	Date	No. of period available	Theory Topics
1 st	22/08/2024	01	Introduction, syllabus discussion and define the vision, mission, PEOs of the department
	23/08/2024	02	Unit-1: DIODE, TRANSISTORS AND CIRCUITS 1.1 Working principle, of Diode & its current equation, Specification and use of p-n junction diode.
2 nd	27/08/2024	01	1.2 Breakdown of diode (Avlance&Zener Breakdown) and Construction, working, Characteristics
	29/08/2024	01	1.3 Classification of Rectifiers and working of different types of Rectifiers- Half-Wave Rectifier, Full-Wave Rectifier (CT & BRIDGE type)
	30/08/2024	02	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. 1.5 Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them.

	02/09/2024	01	<p>1.6</p> <p>Basic concept of Biasing, Types of Biasing, h-parameter model of BJT, load line (AC &DC) and determine the Q-point.</p> <p>1.7</p> <p>Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled Amplifier & draw the curve.</p>
3 rd	03/09/2024	01	<p>Unit-2: AUDIO POWER AMPLIFIERS</p> <p>2.1</p> <p>Classify Power Amplifier & Differentiate between Voltage and Power Amplifier.</p>
	05/09/2024	01	<p>2.2 Working principle of different types of Power Amplifier (Class-A, Class-AB, Class-B and Class-C & Class D amplifier).</p>
	06/09/2024	02	<p>2.3 Construction and working principle and advantages of Push Pull (Class-B) Amplifiers</p>
4 th	09/09/2024	01	<p>Unit-3: FIELD EFFECT TRANSISTOR (FET)</p> <p>3.1 FET & its classifications & Differentiate between JFET & BJT.</p> <p>3.2 Construction, working principle & characteristics of JEFT & Explain JEFT as an amplifier, parameters of JFET & Establish relation among</p>

			JFET parameters.
	10/09/2024	01	3.3 Construction & working principle MOSFET & its classification & characteristics (Drain & Transfer)
	12/09/2024	01	Internal Assessment
	13/09/2024	02	Internal Assessment
5 th	17/09/2024	01	3.4 Explain the operation of CMOS, VMOS & LDMOS.
	19/09/2024	01	Unit-4: FEED BACK AMPLIFIER & OSCILLATOR 4.1 Define & classify Feedback Amplifier, principle of negative feedback with the help of block diagram, Types of feedback – negative & positive feedback.
	20/09/2024	02	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
6 th	23/09/2024	01	4.3 Oscillator -block diagram of sine wave oscillator, Types Requirement of oscillation- Barkhausen criterion
	24/09/2024	01	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
	26/09/2024	01	Unit-5: TUNED AMPLIFIER & WAVE SHAPING CIRCUIT 5.1 Defined and classify Tuned amplifier, Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance. 5.2 working principle of Single tuned Voltage & Double tuned Amplifier & its limitation
	27/09/2024	02	5.3 Different type of Non-linear circuits - Clipper, diode series & shunt, positive & negative biased & unbiased and combinational clipper clippers circuit & its application. 5.4 Different type of Clamper circuit (positive & negative clampers) & its application.
7 th	30/09/2024	01	5.5 Working of Astable, Monostable & Bistable Multivibrator with circuit diagram.
	01/10/2024	01	5.6 Working & use of Integrator and Differentiator circuit using R- C circuit (Linear), input / output waveforms & frequency response.
	03/10/2024	01	Unit-6: OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS 6.1 Differential amplifier & explain its configuration & significance. 6.2 Block diagram representation of a typical Op- Amp, its equivalent circuits

			and draw the schematic symbol
	04/10/2024	02	<p>6.3 Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information.</p> <p>6.4 Define the following electrical characteristics input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate .</p>
8 th	14/10/2024	01	6.5 Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier)
	15/10/2024	01	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.
	18/10/2024	01	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.
9 th	21/10/2024	01	<p>Unit-7. APPLICATION OF OPERATIONAL AMPLIFIER, TIMER CIRCUITS& IC voltage regulator</p> <p>7.1 Discuss the summing scaling and averaging of inverting and non-inverting amplifiers</p>

	22/10/2024	01	7.2 DC & AC Amplifies using OP-AMP.
	24/10/2024	01	7.3 Integrator and differentiator using op-amp.
	25/10/2024	02	7.4 Active filter and describe the filter design of fast order low Pass Butterworth 7.5 Concept of Zero-Crossing Detector using Op-Amp
10 th	28/10/2024	01	7.6 Block diagram and operation of IC 555 timer & IC 565 PLL & its applications.
	29/10/2024	01	7.7 Working of Current to voltage Convertor using Operational Amplifier
	01/11/2024	02	7.8 Working of the Voltage to Frequency Convertor using Operational Amplifier. 7.9 Working of the Frequency to Voltage Conversion using Operational Amplifier.
11 th	04/11/2024	01	7.10 Operation of power supply using 78XX and 79XX, LM 317 Series with their PIN configuration
	05/11/2024	01	7.11 Functional block diagram & Working of IC regulator LM 723 & LM 317.

	07/11/2024	01	Revision
	08/11/2024	02	Question Answer Discussion