BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Sidharth Sekhar Mallick, Lecturer in AE&I

Academic Session- 2024-2025(Winter-2024)

(3rd Sem.) Circuit Theory

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THEDEPARTMENT:-

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 : 3rd		Name of the teaching faculty: Sidharth Sekhar Mallick
Subject: Circuit Theory	No. of Days/per week class allotted: **04 periods/per week**(MON ,TUE , THU & FRI:- 1 Period each)		Semester From Date:- 01-07-2024 To Date:- 08-11-2024 No. of weeks: 18 weeks
Week	Date	No. of period available	Theory Topics
1st	01/07/2024	01	Introduction, syllabus discussion and define the vision, mission, PEOs of the department
	02/07/2024	01	**Unit-1**: CIRCUIT ELEMENTS& ENERGY SOURCES 1.1 Circuit elements (Resistance, Inductance, Capacitance), Scope of network analysis & synthesize
	03/07/2024	01	1.2 Voltage Division & Current Division, Energy Sources
	04/07/2024	01	1.3 Electric charge, electric current, Electrical energy, Electrical potential, R-L-C parameters, Active& Passive Elements.
	05/07/2024	01	1.4 Energy Sources, Current and voltage sources and their transformation & mutual inductance
	06/07/2024	01	1.5 Star – Delta transformation
2nd	08/07/2024	01	simple problems of above Circuit
	09/07/202	01	**Unit-2:** NETWORK THEOREMS (Applications in dc circuits) 2.1 Nodal of Electrical Circuits with simple problem, Continue…
	10/07/2024	01	2.1 Mesh Analysis of Electrical Circuits with simple problem.
	11/07/2024	01	2.2 Thevenin's Theorem Statement Explanation & applications.
	12/07/2024	01	Norton's Theorem Statement Explanation & applications.
	13/07/2024	01	Maximum Power transfer Statement Theorem Explanation & applications.
3rd	15/07/2024	01	Superposition Theorem Theorem Statement Explanation & applications.
	16/07/2024	01	Millman Theorem, Reciprocity Theorem-Statement, Explanation & applications.
	18/07/2024	01	2.3 Solve numerical problems of above theorem
	19/07/2024	01	2.3 Solve numerical problems of above theorem
	20/07/2024	01	2.3 Solve numerical problems of above theorem
4th	22/07/2024	01	**Revision on Chapter 1 & 2**
	23/07/2024	01	**Class Test -1**
	24/07/2024	01	**Unit-3:** Power Relation in AC circuits & Transient Response of passive circuits 3.1 Definition of frequency, Cycle, Time period, Amplitude, Average value, RMS value, Cont...
	25/07/2024	01	3.1 Instantaneous power & Form factor, Apparent power, Reactive power, power Triangle of AC Wave.
	26/07/2024	01	3.2 Phasor representation of alternating quantities.
	27/07/2024	01	3.3 Single phase Ac circuits-Behaviours of A.C. through pure Resistor,

			Inductor with problem.
5th	29/07/2024	01	3.3 Single phase Ac circuits-Behaviours of A.C. through pure Capacitor with problem
	30/07/2024	01	3.4 DC Transients-Behaviors of R-L circuit with problem & draw the phasor diagram and voltage triangle
	31/07/2024	01	3.4 DC Transients-Behaviors of R-C series circuit & draw the phasor diagram and voltage triangle.
	01/08/2024	01	3.5 DC Transients-Behaviors of R-L-C series circuit & draw the phasor diagram and voltage triangle.
	02/08/2024	01	3.5 Define Time Constant of the above Circuit
	03/08/2024	01	3.6 Solve numerical simple problems of above Circuit.
6th	05/08/2024	01	3.6 Solve numerical simple problems of above Circuit.
	06/08/2024	01	**Unit-4:** RESONANCE AND COUPLED CIRCUITS 4.1 Introduction to resonance circuits & Resonance tuned circuit,
	07/08/2024	01	4.2 Series& Parallel resonance
	08/08/2024	01	4.3 Expression for series resonance, Condition for Resonance, Frequency of Resonance, continued.
	09/08/2024	01	4.3 Impedance, Current, Voltage, power, Q Factor and Power Factor of Resonance, Bandwidth in term of Q.
	10/08/2024	01	4.4 Parallel Resonance (RL, RC & RLC) & derive the expression
7th	12/08/2024	01	4.5 Comparisons of Series & Parallel resonance& applications
	13/08/2024	01	4.6 simple problems of above Circuit
	14/08/2024	01	4.6 simple problems of above Circuit
	16/08/2024	01	4.6 simple problems of above Circuit
	17/08/2024	01	**Revision on Chapter -3 & 4**
8th	20/08/2024	01	**Class Test -2**
	21/08/2024	01	**Unit-5:** LAPLACE TRANSFORM AND ITS APPLICATIONS 5.1 Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-L, Continued...
	22/08/2024	01	5.1 Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-C &R-L-C
	23/08/2024	01	5.2 Analysis and derive the equations for circuit parameters of Impulse response of R-L, R-C.
	24/08/2024	01	5.2 Analysis and derive the equations for circuit parameters of Impulse response of R-L-C.
9th	27/08/2024	01	simple problems of above Circuit
	29/08/2024	01	simple problems of above Circuit
	30/08/2024	01	Previous semester question Discussion
10th	02/09/2024	01	**Unit-6:** Two Port Network Analysis 6.1 Network elements, ports in Network (One port, two port)
	03/09/2024	01	6.2 Network Configurations (T & pie).

	05/09/2024	01	6.3 Open circuit (Z-Parameter)
	06/09/2024	01	6.3 Short Circuit(Y-Parameter) Parameters,
11th	09/09/2024	01	6.3 Calculate open & short Circuit Parameters for Simple Circuits & its conversion.
	10/09/2024	01	**Internal Assessment**
	11/09/2024	01	**Internal Assessment**
	12/09/2024	01	6.4 h- parameter (hybrid parameter) Representation
	13/09/2024	01	6.5 Define T-Network & pie – Network
12th	17/09/2024	01	Simple problems of above Circuit
	19/09/2024	01	Simple problems of above Circuit
	20/09/2024	01	Simple problems of above Circuit
13th	23/09/2024	01	Previous semester question Discussion
	24/09/2024	01	**Revision on Chapter -4**
	26/09/2024	01	**Revision on Chapter -5**
	27/09/2024	01	**Revision on Chapter -6**
14th	30/09/2024	01	**Class Test -3**
	01/10/2024	01	**Unit-7:** FILTERS& ATTENUATORS 7.1 Ideal &Practical filters and its applications, cut off frequency, pass band and stop band
	03/10/2024	01	7.2 Classify filters- low pass, high pass, & study their Characteristics, continued...
	04/10/2024	01	7.2 Classify filters band pass, band stop filters& study their Characteristics
15th	14/10/2024	01	7.3 Butterworth Filter Design
	15/10/2024	01	7.4 Attenuation and Gain, Bel, Decibel &neper and their relations
	17/10/2024	01	7.5 Attenuators& its applications. Classification-T- Type continued.
	18/10/2024	01	7.5 PI – Type attenuators
16th	21/10/2024	01	Simple problems of above Circuit
	22/10/2024	01	Simple problems of above Circuit
	24/10/2024	01	**Revision on Chapter -7**
	25/10/2024	01	Quiz test on unit-1,2,3 and question discussion
17th	28/10/2024	01	Quiz test on unit-4,5,6&7 and question discussion
	01/11/2024	01	Quiz test on unit-4,5,6&7 and question discussion
18th	04/11/2024	01	**Class Test-4**
	05/11/2024	01	Revision and important question on unit-1 & 2
	07/11/2024	01	Revision and important question on unit-3 & 4
	08/11/2024	01	Revision and important question on unit-5,6 &7