

**BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK**

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

**Session- 2022-2033**

## **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.

<b>Discipline:</b> Applied Electronics & Instrumentation Engineering.	<b>Semester :</b> 3 <sup>rd</sup>	<b>Name of the teaching faculty:</b> Sidharth Sekhar Mallick
<b>Subject:</b> Circuit Theory	No. of Days/per week class allotted: <b>04 periods/per week (MON ,TUE , THU &amp; FRI:- 1 Period each)</b>	Semester From Date:- 15-09-2022 To Date:- 22-12-2022 No. of weeks: <b>16 weeks</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	15/09/2022	Introduction, syllabus discussion and define the vision, mission, PEOS of the department
	16/09/2022	<b>Unit-1: CIRCUIT ELEMENTS&amp; ENERGY SOURCES</b> 1.1 Circuit elements (Resistance, Inductance, Capacitance), Scope of network analysis & synthesize
2 <sup>nd</sup>	19/09/2022	1.2 Voltage Division & Current Division, Energy Sources
	20/09/2022	1.3 Electric charge, electric current, Electrical energy, Electrical potential, R-L-C parameters, Active& Passive Elements.
	22/09/2022	1.4 Energy Sources, Current and voltage sources and their transformation & mutual inductance
	23/09/2022	1.5 Star – Delta transformation
3 <sup>rd</sup>	26/09/2022	Quiz test on unit-1 and important previous year question discussion.
	27/09/2022	<b>Unit-2: NETWORK THEOREMS (Applications in dc circuits)</b> 2.1 Nodal & Mesh Analysis of Electrical Circuits with simple problem.
	29/09/2022	2.2 Thevenin's Theorem, Norton's Theorem, Maximum Power transfer Theorem, continued.
	30/09/2022	2.2 Superposition Theorem, Millman Theorem, Reciprocity Theorem-Statement, Explanation & applications.
4 <sup>th</sup>	03/10/2022	PUJA HOLIDAY
	04/10/2022	
	06/10/2022	
	07/10/2022	
5 <sup>th</sup>	10/10/2022	2.3 Solve numerical problems of above theorem
	11/10/2022	<b>Revision on Chapter 1 &amp; 2</b>
	13/10/2022	<b>Class Test -1</b>
6 <sup>th</sup>	14/10/2022	<b>Unit-3: Power Relation in AC circuits &amp; Transient Response of</b>

		passive circuits 3.1 Definition of frequency, Cycle, Time period, Amplitude, Average value, RMS value, Cont..
7 <sup>th</sup>	17/10/2022	3.1 Instantaneous power & Form factor, Apparent power, Reactive power, power Triangle of AC Wave. 3.2 Phasor representation of alternating quantities
	18/10/2022	3.3 Single phase Ac circuits-Behaviours of A.C. through pure Resistor, Inductor & Capacitor.
	20/10/2022	3.4 DC Transients-Behaviors of R-L, R-C, R-L-C series circuit & draw the phasor diagram and voltage triangle. 3.5 Define Time Constant of the above Circuit
	21/10/2022	3.6 Solve numerical simple problems of above Circuit
8 <sup>th</sup>	25/10/2022	<b>Unit-4: RESONANCE AND COUPLED CIRCUITS</b> 4.1 Introduction to resonance circuits & Resonance tuned circuit 4.2 Series & Parallel resonance
	27/10/2022	4.3 Expression for series resonance, Condition for Resonance, Frequency of Resonance, continued..
	28/10/2022	4.3 Impedance, Current, Voltage, power, Q Factor and Power Factor of Resonance, Bandwidth in term of Q.
9 <sup>th</sup>	31/10/2022	4.4 Parallel Resonance (RL, RC & RLC) & derive the expression 4.5 Comparisons of Series & Parallel resonance & applications
	01/11/2022	4.6 simple problems of above Circuit
	03/11/2022	<b>Revision on Chapter -3 &amp; 4</b>
	04/11/2022	<b>Class Test -2</b>
10 <sup>th</sup>	07/11/2022	<b>Unit-5: LAPLACE TRANSFORM AND ITS APPLICATIONS</b> 5.1 Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-L, Continued...
	10/11/2022	5.1 Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-C & R-L-C
	11/11/2022	5.2 Analysis and derive the equations for circuit parameters of Impulse response of R-L, R-C, R-L-C
	14/11/2022	<b>Internal assessment</b>
11 <sup>th</sup>	15/11/2022	<b>Internal assessment</b>
	17/11/2022	<b>Unit-6: Two Port Network Analysis</b>

		6.1 Network elements, ports in Network (One port, two port), 6.2 Network Configurations (T & pie).
	18/11/2022	6.3 Open circuit (Z-Parameter)& Short Circuit(Y-Parameter) Parameters, continued..
12 <sup>th</sup>	21/11/2022	6.3 Calculate open & short Circuit Parameters for Simple Circuits & its conversion.
	22/11/2022	6.4 h- parameter (hybrid parameter) Representation
	24/11/2022	6.5 Define T-Network & pie – Network
	25/11/2022	<b>Revision on Chapter -5 &amp; 6</b>
13 <sup>th</sup>	28/11/2022	<b>Class Test -3</b>
	29/11/2022	<b>Unit-7: FILTERS&amp; ATTENUATORS</b> 7.1 Ideal & Practical filters and its applications, cut off frequency, pass band and stop band
	01/12/2022	7.2 Classify filters- low pass, high pass, & study their Characteristics, continued...
	02/12/2022	7.2 Classify filters band pass, band stop filters& study their Characteristics
14 <sup>th</sup>	05/12/2022	7.3 Butterworth Filter Design
	06/12/2022	7.4 Attenuation and Gain, Bel , Decibel & neper and their relations
	08/12/2022	7.5 Attenuators& its applications. Classification-T- Type continued..
	09/12/2022	7.5 PI – Type attenuators
15 <sup>th</sup>	12/12/2022	Quiz test on unit-1,2,3 and question discussion
	13/12/2022	Quiz test on unit-4,5,6&7 and question discussion
	15/12/2022	Quiz test on unit-4,5,6&7 and question discussion
	16/12/2022	<b>Class Test-4</b>
16 <sup>th</sup>	19/12/2022	Revision and important question on unit-1 & 2
	20/12/2022	Revision and important question on unit-3 & 4
	22/12/2022	Revision and important question on unit-5,6 & 7