



# **BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**

**Lesson Plan of Sai Dibyashree Swami, Guest faculty 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.

Instrumentation Engineering.			
<b>Subject:</b> Biomedical & Environmental Instrumentation	No. of Days/per week class allotted: <b>04</b> <b>periods/per week</b> (MON ,WED:-1 & FRI:- 2 Period each)	<b>Semester From Date:-</b> 22-08-2024 <b>To Date:-</b> 08-11-2024 <b>No. of weeks:</b> 11 weeks	
<b>Week</b>	<b>Date</b>	<b>No. of period available</b>	<b>Theory Topics</b>
1 <sup>st</sup>	22/08/2024	01	Introduction, syllabus discussion and define the vision, mission, PEOs of the department
	23/08/2024	02	<b>Unit-1: INTRODUCTION TO BIOMEDICAL INSTRUMENTATION</b> 1.1 Define human parameter measurement system and explain its contents
2 <sup>nd</sup>	28/08/2024	01	1.2 Fundamentals and specification of biomedical instrumentation system
	30/08/2024	02	Nervous system, Respiratory system
3 <sup>rd</sup>	02/09/2024	01	1.3 Different types of sensors & transducers for biological application 1.4 Explain sources of bio electric potential
	04/09/2024	01	<b>Revision on Chapter 1</b>
	06/09/2024	02	<b>Unit-2: MEASUREMENT OF ELECTRICAL BIOLOGICAL PARAMETER</b> 2.1 Lead and electrodes 2.2 Electrocardiography. 2.3 Electrical activity of heart.
4 <sup>th</sup>	11/09/2024	01	2.4 Equivalent cardiac generator 2.5 Electro cardiogram(ECG)
	13/09/2024	02	2.6 Standardization of recording & display of electrocardiogram (ECG). 2.7 EEG (Electro encephalogram).
5 <sup>th</sup>	18/09/2024	01	<b>Internal Assessment</b>
	20/09/2024	02	2.8 EMG (Electro myogram). 2.9 EOG (Electrooculogram) 2.10 ERG (Electroretinogram)
6 <sup>th</sup>	23/09/2024	01	2.11 EGG. (Electrogastrogram)
	25/09/2024	01	<b>Unit-3: MEASUREMENT OF NON-ELECTRICAL BIOLOGICAL PARAMETER</b> 3.1 Blood flow measurement
	27/09/2024	02	3.2 Study of drop recorded. 3.3 Electromagnetic flow meter. 3.4 Measurement of systolic & diastolic pressure. 3.5 Heart sound.
7 <sup>th</sup>	30/09/2024	01	3.6 Electrical stethoscope.

			3.7 Pulmonary function analyzer.
	04/10/2024	02	<b>Unit-4: MODERN MEDICAL IMAGING SYSTEM</b> 4.1 Medical display system. 4.2 Medical thermography X-ray.
8 <sup>th</sup>	14/10/2024	01	4.3 Basic of X-ray & radioisotope instrumentation. 4.4 Instrumentation for diagnostic x-ray & handling of x-ray machine.
	18/10/2024	01	4.5 Basic concept & operation of digital x-ray machine. 4.6 Real time ultrasonic imaging system. 4.7 Eco-cardiograph.
9 <sup>th</sup>	21/10/2024	02	<b>Unit-5: BIOLOGICAL LABORATORY INSTRUMENT</b> 5.1 Define blood cell. 5.2 Explain chemical test on blood.
	23/10/2024	01	5.3 Explain the working of blood cell counter by conductivity method. 5.4 Explain spectrophotometer type instrument.
	25/10/2024	02	5.5 Function of clinical flame photometer. 5.6 Explain & function of compound Microscope. <b>Revision on Chapter 4,5.</b>
10 <sup>th</sup>	28/10/2024	01	<b>Unit-6: MEASUREMENT OF BIOLOGICAL CHEMICAL PARAMETER.</b> 6.1 Measurement of CO (Carbon monoxide). 6.2 Oxygen concentration in exhaled air.
	30/10/2024	01	6.3 Blood & lungs. 6.4 PH. value of blood. 6.5 Impedance plethysmography blood gas analyzer.
	01/11/2024	02	<b>Unit-7: PATIENT safety &amp; electrical safety of Medical equipment</b> 7.1 Application of biomedical engineering & computer application in medical field. 7.2 Tele medicine. 7.3 Physiological effect of electrical current.
11 <sup>th</sup>	04/11/2024	01	7.4 Shock hazard of electrical biomedical equipment. 7.5 Hospital instrumentation & management.
	06/11/2024	01	<b>Class Test</b> <b>Revision on Chapter 2,3.</b>
	08/11/2024	02	<b>Revision on Chapter 6,7.</b>