ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

V SEMESTER	**PHYSICS**	TIME: 3Hrs/week
PH-E3-5404 (3)	**ELECTRONIC INSTRUMENTATION**	Max.Marks:100
w.e.f. 20AH Batch	**SYLLABUS**	

COURSE OBJECTIVES:

- Identify various facilities required to set up a basic Instrumentation Laboratory.
- Acquire a critical knowledge of various Electrical Instruments used in the Laboratory.
- Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience.

COURSE OUTCOMES:

- *Understand the Principle and operation of different display devices used in the display systems and different transducers.*
- *Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oxymeter etc. and know the handling procedures with safety and security.*

UNIT – I: INTRODUCTION TO INSTRUMENTS (10 hrs.)

Types of electronic Instruments- Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, 3½display and 4½ display Digital multimeters, Basic ideas on Function generator.

UNIT – II: OSCILLOSCOPE (10 hrs.)

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (DC and DC), frequency, phase difference, Different types of oscilloscopes and their uses, Digital storage Oscilloscope.

UNIT – III: TRANSDUCERS (10 hrs.)

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fibre optic sensors.

UNIT – IV: DISPLAY INSTRUMENTS (10 hrs.)

Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSD's (Common Anode &Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Principle and working of 2x16 display and 4x16 LCD modules, Applications of LCD modules.

UNIT - V: BIOMEDICAL INSTRUMENTS (10 hrs.)

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethescope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse oxymeter (x) Glucometer, Basic ideas of CT scan and MRI scan.

REFERENCE BOOKS:

1. Electronic Instrumentation by H.S.Kalsi , TMH Publishers.
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation byMandeep Singh, PHI Learning.
4. Biomedical Instrumentation and Measurements by Leslie Cromwell ,Prentice Hall India.
5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D. Halfrick, A.B., PHI Learning, New Delhi
8. Web sources suggested by the teacher concerned and the college librarian including reading material.

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