

Branch Name:	Physics
Program Code:	SC105
Course Name:	Experimental and Measurement Techniques
Course Code:	2SC1050622
Pre-requisite Course:	Basic Knowledge of measurement techniques

Course Objectives:

1. To develop an actual understanding of Numerical analysis in physical measurement.
2. To know the basic concept of Temperature and Optical Measurement Techniques.
3. To understand the use of various devices in experiments.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	--	--	2	35	15	--	--	50

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Numerical analysis in physical measurement: Measurement, The result of a measurement, Sources of uncertainty and experimental error, Systematic error, Random error, Definition of uncertainty, The analysis of repeated measurements, Mathematical description of data distribution functions.	12	50
2	Temperature and Optical Measurement Techniques Transducer definition, Transducer characteristics, Temperature measurements, Definition of temperature, Temperature transducers: Resistance thermometers, Thermistors, Thermocouples, Thermal radiation temperature measurements: Infra-red pyrometers, Low temperature thermometry, Optical measurements: Bolometers, Photoconductive detectors, Photoemissive detectors.	12	50

Reference Books:

1. Measurement, Instrumentation and Experiment Design in Physics and Engineering by Michael Syer and Abhai Mansingh, PHI Learning Pvt. Ltd.
2. Experimental Methods for Engineers by J.P. Holman, 7th Edition, Tata McGraw Hill
3. Advanced Experimental Techniques in Modern Physics by K. Muraleedhara Varier, Anthony Jodroph, P.P Pradyumanan, Pragati Prakashan

List of Open Source Software/learning website:

1. <https://www.youtube.com/watch?v=jjTq4eckKqo>
2. <https://www.youtube.com/watch?v=LYgEIyJOVHo>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Describe the result of a measurement.	1 Remembering
CLO2	Discuss the Sources of uncertainty and experimental error.	2 Understanding
CLO3	Solve the numerical based on Error Analysis.	3 Applying
CLO4	Explain Temperature and Optical Measurement Techniques.	4 Analyzing
CLO5	Justify the use of detector in various fields.	5 Evaluating
CLO6	Design new Temperature sensor device.	6 creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Programme Outcomes (POs)									Programme Specific Outcome (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CLO1	M										
CLO2			L							H	
CLO3											
CLO4					M					M	
CLO5											
CLO6		H						H		M	

H: High, M: Medium, L: Low