



GOVERNMENT POLYTECHNIC DARLIPALI, SUNDARGARH

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ ଦଲିପାଲି, ସୁନ୍ଦରଗଡ଼

GOVERNMENT OF ODISHA | ଓଡ଼ିଶା ସରକାର

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DEPARTMENT OF AE&I ENGINEERING

LESSON PLAN(2025-2026)

Discipline: AE&I ENGINEERING					Semester: 3rd	Name of the Teaching faculty: Sidharth Sekhar Mallick	
Subject: Fundamentals of Instrumentation Subject Code: AEIEPC20 (TH:1)		No of Days/Week class allotted: 3		Semester from Date: 14/7/2025 to 15/11/2025 No of weeks: 18 No. of Period Available: 45			
Month	Week	No of periods available	Class Day Theory topics to be covered				
JULY	1st	3P	Introduction, Syllabus Discussion				
			Unit-1: Principles of measurement, units & standards:				
			1.1 Idea of measurement of process & measuring instrument				
	2nd	3P	1.2 Selection criteria of measuring instrument				
			1.3 Concept instrumental units.				
			1.4 The relationship between electrostatic unit & electromagnetic unit.				
	3rd	3P	1.5 Concept of S.I system of units & its advantage & disadvantage: S.I. based units, supplementary units, derived units.				
			1.6 Classification of standards: Absolute standard, Secondary standard, Inter laboratory standard.				
			Unit-2: Principles of Instrumentation:				
AUGUST	4th	3P	2.1 Definition of Terminology: Measurement, Instrumentation and Metrology				
			2.2 Basic concepts of Instrumentation, Model of generalized measurement system and function of different components. Continuing...				
			2.2 Basic concepts of Instrumentation, Model of generalized measurement system and function of different components.				
	5th	2P	2.3 Performance Characteristics of Instruments : Static & Dynamic characteristics, Specification, range, sensitivity, accuracy, precision Continuing...				
			2.3 Performance Characteristics of Instruments : Static & Dynamic characteristics, error, drift, threshold, resolution, hysteresis, correction, span, linearity, repeatability, reproducibility, speed of response, lag, fidelity, (Definition with brief explanation only) Continuing...				
			2.3 Performance Characteristics of Instruments : Static & Dynamic characteristics, resolution, hysteresis, correction, span, linearity, repeatability, reproducibility, speed of response, lag, fidelity, (Definition with brief explanation only)				
	6th	3P	2.4 Calibration of instruments, need and methods				
			Revision Unit-1 & 2				
			Class Test-I				

			Unit-3 Errors in Measurement and Statistical analysis: 3.1 Errors in measurement: definitions, noise in measurement systems using statistical concept, Random and Systematic error, Reduction of error. Continuing..
	7th	2P	Unit-3 Errors in Measurement and Statistical analysis: 3.1 Errors in measurement: definitions, noise in measurement systems using statistical concept, Random and Systematic error, Reduction of error. 3.2 Loading effects on measuring systems. Reduction of loading error Continuing..
	8th	2P	3.2 Loading effects on measuring systems. Reduction of loading error.
SEPTEMBER			3.3 Probability distribution function, chi-square test, curve fitting technique, power spectral density and autocorrelation. Static characteristics of a system: relating with statistical analysis. Continuing..
	9th	3P	3.3 Probability distribution function, chi-square test, curve fitting technique, power spectral density and autocorrelation. Static characteristics of a system: relating with statistical analysis. Continuing..
			3.3 Probability distribution function, chi-square test, curve fitting technique, power spectral density and autocorrelation. Static characteristics of a system: relating with statistical analysis. Continuing..
			3.3 Probability distribution function, chi-square test, curve fitting technique, power spectral density and autocorrelation. Static characteristics of a system: relating with statistical analysis.
	10th	3P	Revision Unit-3 Class Test-II Internal Assessment-I
	11th	3P	Internal Assessment-I Unit-4 Elements of instrumentation system: 4.1 Generalized input-output configurations of measuring systems: Desired, interfering and modifying input. Continuing.. 4.1 Generalized input-output configurations of measuring systems: Desired, interfering and modifying input.
OCTOBER	12th	1P	4.2 Electrical equivalents of mechanical and other systems, input-output configurations.
	13th	3P	4.3 Types of standard test signals (impulse, step, ramp and parabolic) and their characteristics. 4.4 Classification of systems according to their mode of operation: Basic idea of electronic, pneumatic and hydraulic instrumentation 4.5 Need of Signal conditioning elements, Block diagram and examples
	14th	3P	Revision Unit-4 Class Test-III Internal Assessment-II
	15th	3P	Internal Assessment-II Unit-5 Mathematical Models of systems: 5.1 Mathematical Models of 1st and 2nd order systems, Examples Continuing.. 5.1 Mathematical Models of 1st and 2nd order systems, Examples.

NOVEMBER	16th	3P	5.2 System transfer function Continuing..
			5.2 System transfer function.
			5.3 Step response of 1st and 2nd order system and its time domain specification Continuing..
	17th	2P	5.3 Step response of 1st and 2nd order system and its time domain specification
			Revision Unit-5
	18th	3P	Quiz Test
			Revision & Previous year question & answer discussion
			Revision & Previous year question & answer discussion

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