VIDHYADEEP UNIVERSITY
Holy Flame of Knowledge

SECOUND-YEAR DIPLOMA ENGINEERINGSYLLABUS

Semester: 3rd

Course Code: 002203305 **Type of Course: PCC-5**

Course Name: ELECTRICAL INSTRUMENTATION

Course Prerequisites: Basic Knowledge of Electrical Instrumentation.

COURSE OBJECTIVE(S):

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

A) Interpret different terms related to measurement and instrumentation
B) Measure circuit parameters using potentiometers and DC and AC bridges.
C) Use electromechanical instruments for measurement of electrical quantities.
D) Calibrate ammeter, voltmeter, wattmeter and energy meter as per IS.
E) Use transducers to measure various non-electrical quantities.

TEACHING & EXAMINATION SCHEME:

Teaching Scheme (Hrs/Week)				Examination Scheme					
Theory	Tutorial	Practical	Credit	SEE		CA			Total
				Th	Pr	MSE	PLE	LA	
4	0	0	4	60	0	20	20	0	100

SEE: Semester End Examination; CA: Continuous Assessment; Th: Theory; Pr: Practical; MSE: Mid Semester Examination; PLE: Participatory Learning Experience; LA: Laboratory Assessment

*TOTAL Theory Hours: No. of Th. and Tut.Hrs/Week*15 = 60*

COURSE CONTENT(S):

Unit No.	Content	Hours	Weightage (%)
1	**Fundamentals of measurement & instrumentation** 1.1 Methods of measurement -Direct and indirect methods 1.2 Types of Instruments - Indicating, integrating and recording,absolute and secondary instrument 1.3 Deflecting, Controlling and damping torques 1.4 Range, true value, indicated value, correction, sensitivity,repeatability, reproducibility, Precision, Accuracy, significant figure, etc. 1.5 Different Types and sources of error : gross error,systematic error , random error	06	12%
2	**Potentiometesand Bridges** 2.1 Construction and working of DC potentiometer, and its applications. 2.2 Types of Potentiometers. 2.3 Types of resistances.	13	25%

SECOUND-YEAR DIPLOMA ENGINEERINGSYLLABUS

	2.4 Explain the procedure to measure low resistance by Kelvin's double bridgewith sketches. 2.5 Explain the procedure to measure medium resistances by Wheatstone's bridge and other Methods withsketches. 2.6 Study the need of a Megger. 2.7 Study the need of a earth tester. 2.8 Select an A.C. bridge to determine Inductance and capacitance.		
3	**Electromechanical Instruments** 3.1 List the common errors in various Electromechanical measuring instruments. 3.2 Moving iron and PMMC Instruments. 3.3 Electro dynamo meter type and induction type Meters. 3.4 Induction type Energy meter. (single phase, three phase) 3.5 Electrodynamometer type meter: ammeter, Voltmeter, wattmeter, power factor meter. 3.6 Extension of range of meters using instrument. transformer like CT and PT.	18	25%
4	**Calibration and Testing** 4.1 Justify the necessity of calibration. 4.2 Calibration of ammeter, voltmeter, and wattmeter and single-phase energy meter (along with Adjustments) as per IS.	04	8%
5	**Transducers** **5**.1 Basic requirements of transducers. 5.2 Describe working principle of different types of Electrical transducers. 5.3 Describe working principle of different types of Electro optical transducers. 5.4 Effect of the failure of Transducer.	19	30%
	TOTAL	60	100%

Text Book(s):

Title of the Book	Author(s)	Publication
Electrical Instrumentation	D.R.Mehta	Mehta Prakashan
Electrical Instrumentation	R.P Ajwalia	AtulPrakashan

Reference Book(s):

Title of the Book	Author(s)	Publication
A text book of Electrical Technology Volume-I (Basic Electrical Engineering)	B. L. Theraja& A.K. Theraja	S. Chand and Co., New Delhi, 23 edition or Latest edition.
Principles of electrical	B. R. Gupta	S. K. Kataria& Sons, New

engineering		Delhi, Latest edition
Energy management and conservation	K. Uma Rao& A. Jayalakshmi	Pearson Education, New Delhi Latest Edition.

Web Material Link(s):

a) https://nptel.ac.in/courses/108105153
b) https://nptel.ac.in/courses/108105064
c) https://circuitglobe.com/category/electrical-terms/electrical-instrumentation
d) https://www.electrical4u.com/electrical-engineering-articles/measurement/
e) https://www.electrical4u.com/

Equivalent/Corresponding Course on NPTEL (SWAYAM):

NPTEL course on

a)www.nptel.iitm.ac.in

COURSE EVALUATION:

Sr. No.	Activity	Marks	Weightage
1	Semester End Examination (External Th)	60	60%
2	Internal Examination	40	40%
2(a)	Mid Semester Examination	20	
2(b)	Attendance	10	
2(c)	Assessment Types (Any One from 2(c).1 to 2(c).7)	10	
2(c).1	Subject (Course) based Mini-Project		
2(c).2	Industry/Site Visit & Report		
2(c).3	Assignment		
2(c).4	Seminar		
2(c).5	Case Study		
2(c).6	Surprise Class Quiz		
2(c).7	Design Exercise		
2(c).7	Presentation		
2(d)	Practical (if Applicable)		

* For 4 Credit Subjects

1 Credit = 25 Marks
Theory: 3 Credits = 75 Marks
practicals: 1 Credit = 25 Marks
SEE Evaluation will be of 100 marks and converted to 50 Marks (75 Th + 25 Pr)
CA Evaluation will be of 100 Marks and converted to 50 Marks. (75 Th + 25 Pr)

Distribution of Marks for Theory Evaluation as per Bloom's Taxonomy Level:

Level	Remember	Understand	Apply	Analyze	Evaluate	Create

SECOUND-YEAR DIPLOMA ENGINEERINGSYLLABUS

% Weightage	34%	22%	28%	8%	6%	2%

COURSE OUTCOMES:*(in the range of 4 to 6)*

CO1	Understand the illumination.
CO2	Apply appropriate energy conservation methods and opportunities for energy conservation.
CO3	Analyze the luminance levels for the various locations.
CO4	Understand the methodology of lightning system.
CO5	To analyze good lightning practice.