

**LESSON PLAN OF 5<sup>TH</sup> SEMESTER (2022-2023) CHEMICAL ENGINEERING**

Discipline :- CHEMICAL	Semester:-5 <sup>TH</sup>	Name of the Teaching Faculty <b>RAJESH KUMAR DUTTA</b>
Subject:- INSTRUMENTATION & CHEMICAL ANALYSIS	No of Days/per Week Class Allotted :-04	Semester From:- <b>September</b> To:- <b>December</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory/ Practical Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	<b>CHAPTER 1: INSTRUMENT</b> Instruments and its Importance
	2 <sup>nd</sup>	Standard of measurements
	3 <sup>rd</sup>	Functional Elements of Instruments
	4 <sup>th</sup>	Performance characteristics of an Instruments
2 <sup>nd</sup>	1 <sup>st</sup>	<b>CHAPTER 2: MEASUREMENTS OF CHARACTERISTICS</b> Measurements of Viscosity by Redwood Viscometer
	2 <sup>nd</sup>	Falling sphere viscometer
	3 <sup>rd</sup>	Principle and uses of Spectrophotometer
	4 <sup>th</sup>	Cont. Principle and uses of Spectrophotometer
3 <sup>rd</sup>	1 <sup>st</sup>	Poalrimetry, Principle and uses of Polarimeter
	2 <sup>nd</sup>	Principle and uses of Polarimeter
	3 <sup>rd</sup>	Refraction, Refractive Index Measurement of Refractive index by Refraction
	4 <sup>th</sup>	Measurements of Refractive index by Refraction
4 <sup>th</sup>	1 <sup>st</sup>	Continuous Viscometer
	2 <sup>nd</sup>	<b>CHAPTER 3: PH MEASUREMENTS</b> Introduction
	3 <sup>rd</sup>	Measurements of PH meter
	4 <sup>th</sup>	<b>Introduction to Electric Conductivity</b> Introduction
5 <sup>th</sup>	1 <sup>st</sup>	Conductivity
	2 <sup>nd</sup>	Measurements of Electric Conductivity
	3 <sup>rd</sup>	<b>CHAPTER 4: TEMPERATURE MEASUREMENTS</b> Introduction to Temperature
	4 <sup>th</sup>	Different Temperature Scale
6 <sup>th</sup>	1 <sup>st</sup>	Different Temperature Scale
	2 <sup>nd</sup>	Different method of Temperature Measurements
	3 <sup>rd</sup>	Different method of Temperature Measurements
	4 <sup>th</sup>	Temperature measurements by Liquid in glass Thermometer
7 <sup>th</sup>	1 <sup>st</sup>	Temperature measurements by Liquid in glass Thermometer
	2 <sup>nd</sup>	<b>CHAPTER 4: Temperature measurements by Electrical</b>

		<b>Phenomena</b>
		Introduction
	3 <sup>rd</sup>	Temperature measurements by Resistance Thermometer
	4 <sup>th</sup>	Temperature measurements by Resistance Thermometer
8 <sup>th</sup>	1 <sup>st</sup>	Temperature measurements by Thermocouple
	2 <sup>nd</sup>	Cont. Temperature measurements by Thermocouple
	3 <sup>rd</sup>	Pyrometer , Introduction to Pyrometer
	4 <sup>th</sup>	Radiation Pyrometer
9 <sup>th</sup>	1 <sup>st</sup>	Cont. Radiation Pyrometer
	2 <sup>nd</sup>	Optical Pyrometer principle
	3 <sup>rd</sup>	Cont. Optical Pyrometer
	4 <sup>th</sup>	Application of Pyrometer
10 <sup>th</sup>	1 <sup>st</sup>	<b>CHAPTER 5: PRESSURE MEASUREMENTS</b> Introduction to Pressure
	2 <sup>nd</sup>	Different types of pressure
	3 <sup>rd</sup>	Cont. different types of pressure
	4 <sup>th</sup>	Different method of measurements of pressure
11 <sup>th</sup>	1 <sup>st</sup>	Cont. different method of measurements of pressure
	2 <sup>nd</sup>	Pressure measurements by Bourdon tube
	3 <sup>rd</sup>	Cont. Pressure measurements by Bourdon tube
	4 <sup>th</sup>	Pressure measurement by Bourdon tube
12 <sup>th</sup>	1 <sup>st</sup>	Pressure measurements by Bellows
	2 <sup>nd</sup>	Cont. Pressure measurements by Bellows
	3 <sup>rd</sup>	Maintenance and repair of pressure measuring instruments
	4 <sup>th</sup>	Cont. Maintenance and repair of pressure measuring instruments
13 <sup>th</sup>	1 <sup>st</sup>	<b>CHAPTER 6: AUTOMATIC CONTROL</b> Automatic control system
	2 <sup>nd</sup>	Explain the application with example
	3 <sup>rd</sup>	Elementary idea about transfer function for first order system
	4 <sup>th</sup>	Time constant and transfer function
14 <sup>th</sup>	1 <sup>st</sup>	Block diagram and components of process control system
	2 <sup>nd</sup>	Servo and regulatory type control
	3 <sup>rd</sup>	Types of control system, advantages and Dis-advantages
	4 <sup>th</sup>	Open loop and closed loop control
15 <sup>th</sup>	1 <sup>st</sup>	Elementary idea about different types of automatic controllers
	2 <sup>nd</sup>	Principle of PLC
	3 <sup>rd</sup>	Computer aided measurement and Control
	4 <sup>th</sup>	Application of PLC.