

## Lesson Plan

**Name of Faculty** : Dr. Wazir Singh, Assistant Professor  
**Discipline** : B.Tech.-2<sup>nd</sup> Sem (ECE, EE, ME).  
**Semester** : 2<sup>nd</sup>  
**Subject** : Chemistry (CHY-101-L) and Chemistry Lab (CHY-101-P)  
**Lesson Plan Duration:** 15 weeks (from January, 2018 to April, 2018)  
**Work Load (Lecture/Practical) per week (in hours): Lectures 04 hours, Practical -04 hours**

Week	Theory		Practical	
	Lecture Day	Topic (Including Assignment/Test)	Practical Day	Topic
1 <sup>st</sup>	1	<b>UNIT-I Thermodynamics</b> : Concept of Entropy	1	To prepare standard oxalic acid solution from crystalline oxalic acid. Determination of dissolved oxygen (DO) in the given water sample
	2	Free Energy and Work Functions, Free Energy Change	1	To prepare standard oxalic acid solution from crystalline oxalic acid. Determination of dissolved oxygen (DO) in the given water sample
	3	Chemical Potential, Gibb's Helmholtz Equation, related numerical problems	1	To prepare standard oxalic acid solution from crystalline oxalic acid. Determination of dissolved oxygen (DO) in the given water sample
	4	Problems and Solutions	1	To prepare standard oxalic acid solution from crystalline oxalic acid. Determination of dissolved oxygen (DO) in the given water sample
2 <sup>nd</sup>	5	Clausius-Clapeyron Equation related numerical problems	2	Determination of viscosity of lubricant by Red Wood viscometer (No. 1 and No. 2)
	6	<b>Phase Equilibrium</b> : Phase, Component and degree of freedom	2	Determination of viscosity of lubricant by Red Wood viscometer (No. 1 and No. 2)
	7	Gibb's Phase Rule, One Component System : H <sub>2</sub> O System	2	Determination of viscosity of lubricant by Red Wood viscometer (No. 1 and No. 2)
	8	Problems and Solutions	2	Determination of viscosity of lubricant by Red Wood viscometer (No. 1 and No. 2)
3 <sup>rd</sup>	9	Two Components Pb-Ag System	3	To determine flash point and fire point of an oil by Pensky – Marten's flash point apparatus.
	10	Two Components Zn-Mg System	3	To determine flash point and fire point of an oil by Pensky – Marten's flash point apparatus.
	11	<b>UNIT-II Water and its Treatment</b> : Hardness of water, units of Hardness	3	To determine flash point and fire point of an oil by Pensky – Marten's flash point apparatus.
	12	Problems and Solutions	3	To determine flash point and fire point of an oil by Pensky – Marten's flash point apparatus.
4 <sup>th</sup>	13	Hardness determination (EDTA method) related numerical problems	4	To prepare Phenol-formaldehyde and Urea formaldehyde resin.
	14	Alkalinity of Water and its Determination, related numerical problems	4	To prepare Phenol-formaldehyde and Urea formaldehyde resin.

	15	Methods of prevention of scale and sludge formation	4	To prepare Phenol-formaldehyde and Urea formaldehyde resin.
	16	Problems and Solutions	4	To prepare Phenol-formaldehyde and Urea formaldehyde resin.
5 <sup>th</sup>	17	Treatment of water for domestic use, Potable or drinking water, Quality parameters of drinking water	5	Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
	18	Sedimentation, Coagulation	5	Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
	19	Filtration and disinfection	5	Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
	20	Problems and Solutions Assignment-I	5	Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
6 <sup>th</sup>	21	Water softening	6	<b>Viva-Voce-1</b>
	22	Ion-Exchange process	6	<b>Viva-Voce-1</b>
	23	Desalination of brackish water by Reverse Osmosis	6	<b>Viva-Voce-1</b>
	24	Problems and Solutions	6	<b>Viva-Voce-1</b>
7 <sup>th</sup>		<b>1<sup>st</sup> Minor Test</b>		
8 <sup>th</sup>	25	<b>UNIT-III Corrosion : Dry corrosion</b>	7	Determination of strength of strong acid by titrating it against weak base conductometrically.
	26	Wet Corrosion	7	Determination of strength of strong acid by titrating it against weak base conductometrically.
	27	Electrochemical theory of Corrosion	7	Determination of strength of strong acid by titrating it against weak base conductometrically.
	28	Problems and Solutions	7	Determination of strength of strong acid by titrating it against weak base conductometrically.
9 <sup>th</sup>	29	Types of wet corrosion : Galvanic Corrosion, Differential aeration Corrosion	8	Determination of concentration of KMnO <sub>4</sub> solution spectrophotometrically.
	30	Factors affecting Corrosion	8	Determination of concentration of KMnO <sub>4</sub> solution spectrophotometrically
	31	Corrosion preventive measure : Cathodic protection, Protective coatings	8	Determination of concentration of KMnO <sub>4</sub> solution spectrophotometrically
	32	Problems and Solutions	8	Determination of concentration of KMnO <sub>4</sub> solution spectrophotometrically
10 <sup>th</sup>	33	<b>Batteries : Introduction about batteries, Characteristics of batteries</b>	9	To determine the surface tension of given liquid by means of stalagmometer by drop number method.
	34	Primary and secondary battery systems	9	To determine the surface tension of given liquid by means of stalagmometer by drop number method.
	35	Lead storage & Lithium battery	9	To determine the surface tension of given liquid by means of stalagmometer by drop number method.

	36	Problems and Solutions	9	To determine the surface tension of given liquid by means of stalagmometer by drop number method.
11 <sup>th</sup>	37	<b>Lubricants</b> : Introduction about lubricants	10	Determination of Ca <sup>++</sup> and Mg <sup>++</sup> hardness of water using EDTA solution.
	38	Classification of lubricants	10	Determination of Ca <sup>++</sup> and Mg <sup>++</sup> hardness of water using EDTA solution.
	39	Properties of lubricants	10	Determination of Ca <sup>++</sup> and Mg <sup>++</sup> hardness of water using EDTA solution.
	40	Problems and Solutions	10	Determination of Ca <sup>++</sup> and Mg <sup>++</sup> hardness of water using EDTA solution.
12 <sup>th</sup>	41	<b>UNIT-IV Polymers</b> : Monomers and polymers, polymerization	11	Determination of alkalinity of water sample.
	42	Classification of polymers	11	Determination of alkalinity of water sample.
	43	Types of polymerization	11	Determination of alkalinity of water sample.
	44	Problems and Solutions Assignment-II	11	Determination of alkalinity of water sample.
13 <sup>th</sup>	45	Effect of structure on the properties of polymers	12	<b>Viva-Voce-2</b>
	46	Preparation, properties and application of thermoplastic PVC, thermoset PF and elastomer SBR	12	<b>Viva-Voce-2</b>
	47	<b>Analytical Methods:</b> Principle and application of Thermo Gravimetric Analysis (TGA) and Differential Thermal Analysis (DTA)	12	<b>Viva-Voce-2</b>
	48	Problems and Solutions	12	<b>Viva-Voce-2</b>
14 <sup>th</sup>	<b>2<sup>nd</sup> Minor Test</b>			
15 <sup>th</sup>	49	<b>Spectral analysis</b> : Electromagnetic radiation, Lambert-Beer's Law	13	Final Submission of Record
	50	Principle and applications of UV-VIS spectroscopy	13	Final Submission of Record
	51	Principle and applications of IR spectroscopy	13	Final Submission of Record
	52	Problems and Solutions	13	Final Submission of Record