

Lesson Plan

Name of the Faculty: Mr. Ashutosh Dixit (Theory & Practical)

Discipline: Department of Applied Sciences and Humanities

Semester: 1st

Subject: Applied Chemistry (AS-103N), Applied Chemistry Lab (AS-109N)

Work Load (Lecture/Practical) per week (in hours): Lectures-04, Practicals-02

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1 st	1 st	Zeroth Law of Thermodynamics	1 st	Determination of temporary and permanent hardness by EDTA method
	2 nd	First Law of Thermodynamics		
	3 rd	Second Law of Thermodynamics		
	4 th	Concept of entropy (for reversible and irreversible process, of ideal gases, of phase transition)		
2 nd	5 th	Third Law of Thermodynamics	2 nd	Determination of Ca ²⁺ and Mg ²⁺ hardness of water using EDTA method
	6 th	Free energy		
	7 th	Work function		
	8 th	Gibb's Helmholtz equation		
3 rd	9 th	Numericals	3 rd	To determine the alkalinity of given water sample
	10 th	Clausius-Clayperon equation		
	11 th	Numericals		
	12 th	Phase rule, Terminology and derivation of Gibbsphase rule		
4 th	13 th	Terminology and derivation of Gibbsphase rule	4 th	Determination of Dissolved Oxygen (DO) in given water sample
	14 th	Phase diagrams of water system, sulphur system		
	15 th	Phase diagrams of (Pb-Ag) system, (Zn-Mg) system and (Na-K) system		
	16 th	A1		
5 th	17 th	Hardness of water and its determination by EDTA	5 th	To determine the flash point and fire point of an oil by Pensky-Marten flash point apparatus.
	18 th	Numericals		
	19 th	Alkalinity and its determination		
	20 th	Numericals		
6 th	21 st	Scale and sludge formation (composition, properties and methods of prevention)	6 th	Determination of viscosity of lubricant by Red Wood Viscometer (No. 1 and No. 2)
	22 nd	Scale and sludge formation (composition, properties and methods of prevention)		
	23 rd	Water softening by ion exchange process		
	24 th	Desalination (reverse osmosis, electrodialysis)		
7 th	25 th	Desalination (reverse osmosis, electrodialysis)	7 th	To determine the strength of HCl solution by titrating it

	26 th	Green Chemistry: Definition and concept		with NaOH solution conductometrically
	27 th	Twelve principles of green chemistry		
	28 th	Twelve principles of green chemistry		
8 th	29 th	Twelve principles of green chemistry	8 th	To determine the total iron content (Fe ²⁺ and Fe ³⁺) in an iron ore by internal/self/external indicator method
	30 th	Alternate solvents – ionic liquids		
	31 st	Super critical fluid (SCF) system		
	32 nd	Derivatised and immobilised solvent materials		
9 th	33 rd	A2	9 th	To determine the coefficient of viscosity of a liquid by Ostwald viscometer
	34 th	Dry corrosion		
	35 th	Wet corrosion		
	36 th	Electrochemical theory of corrosion		
10 th	37 th	Pitting	10 th	To determine the strength of strong acid by titrating it with strong base using pH meter
	38 th	Water-line		
	39 th	Differential aeration and stress corrosion		
	40 th	Factors affecting corrosion		
11 th	41 st	Preventive measures (proper design and material selection, cathodic and anodic protection)	11 th	To determine the surface tension of a given liquid by means of stalagmometer by drop number method
	42 nd	Preventive measures (proper design and material selection, cathodic and anodic protection)		
	43 rd	Mechanism of thin and thick layer lubrication		
	44 th	Mechanism of thin and thick layer lubrication		
12 th	45 th	Classification of lubricants and important properties of lubricants (viscosity index, flash and fire point, saponification number, pour point, iodine number)	12 th	Revision
	46 th	Classification of lubricants and important properties of lubricants (viscosity index, flash and fire point, saponification number, pour point, iodine number)		
	47 th	Classification of lubricants and important properties of lubricants (viscosity index, flash and fire point, saponification number, pour point, iodine number)		
	48 th	Greases as lubricants: consistency and drop point test		
13 th	49 th	Greases as lubricants: consistency and drop point test	13 th	Revision
	50 th	A3		
	51 st	Ceramics (brief introduction of clays, silica, feldspar, porcelain and Vitreous Enamels)		
	52 nd	Ceramics (brief introduction of clays, silica, feldspar, porcelain and Vitreous Enamels)		
14 th	53 rd	Cement (introduction, raw materials,	14 th	Revision

		manufacture of portland cement, analysis of cement)		
	54 th	Cement (introduction, raw materials, manufacture of portland cement, analysis of cement)		
	55 th	Cement (introduction, raw materials, manufacture of portland cement, analysis of cement)		
	56 th	Nanoscale materials (introduction, properties of nanomaterials, brief discussion of nanocrystals and clusters, fullerenes, carbon nanotubes, dendrimers, nanowires, nanocomposites)		
15 th	57 th	Nanoscale materials (introduction, properties of nanomaterials, brief discussion of nanocrystals and clusters, fullerenes, carbon nanotubes, dendrimers, nanowires, nanocomposites)	15 th	Revision
	58 th	Nanoscale materials (introduction, properties of nanomaterials, brief discussion of nanocrystals and clusters, fullerenes, carbon nanotubes, dendrimers, nanowires, nanocomposites)		
	59 th	Nanoscale materials (introduction, properties of nanomaterials, brief discussion of nanocrystals and clusters, fullerenes, carbon nanotubes, dendrimers, nanowires, nanocomposites)		
	60 th	A4		

A1: Phase rule

A2: Green chemistry

A3: Properties of lubricant

A4: Nanoscale materials