**Lesson Plan**

**Name of faculty: Dr. S.K Verma , AP**

**Discipline: Applied Science**

**Semester: IInd**

**Subject: Applied Chemistry**

Lesson Plan Duration: 15 weeks (from January, 2018 to April, 2018)

Work Load(Lecture/Practical) per week (in hours): Lectures: 03 hours, Practicals-04 hours, Tutorials:02hours

|  |  |  |
| --- | --- | --- |
| **Week** | **Theory** | **Practical** |
|  | **Lecture day** | **Topic(Including assignment/ test)** | **Practical day** | **Topic** |
| 1st |  | Thermodynamics terms used 2 1st Law | 1 | Determination of Temporary & Permanent hardness of water by EDTA titration |
|  | 2nd, 3rd 7 Zeroth law of thermodynamics  |
|  | Concept of entropy, change of an entropy of an ideal gas |
| 2nd |  | Free energy & work function | 2 | Estimation of Calcium & Magnesium Hardness of water separately by EDTA method |
|  | Gibb’s Helmholtz equation, Clausius-Clapeyron equation |
|  | Chemicals Potential & uses |
| 3rd |  | Numerical Problems | 3 | Determination of Alkalinity of given water sample |
|  | Phase rule, Discussion of term used |
|  | Derivation of Phase rule |
| 4th |  | Discussion of phase diagram of water system | 4 | Estimation of Total Iron in Iron ore Soln. by KMn$o\_{4}$ Method |
|  | Discussion of Sulphar system |
|  | Pb –Ag system 7 its applications |
| 5th |  | Zn –Mg sys & Na-K Sys. | 5 | Estimation of Ferrous & Ferric Iron present Iron ore with $K\_{2}$ C$r\_{2}$ $O\_{7}$ using external indicator method |
|  | Impurities & hardness of water |
|  | Determination of hardness by EDTA its titration method |
| 6th |  | Alkalinity & its determination | 6 | Determination of D.O in water sample by winkers Iodimetric method |
|  | Scale & Sludge formation in boilers |
|  | Discussion of removal of Scale & Sludge formation in boilers |
| 7th |  | Discussion of Ion exchange resins | 7 | Determination strength of Hcl with std. NaoH soln. conductometrically |
|  | Mixed bed ion exchange resin |
|  | Desalination, R.O & Electrolysis |
| 8th |  | Concept of Green chem & its principles | 8 | Determination of viscosity of given Liq. By Ostwold’s Viscometer |
|  | Alternate solvents –Ionic liquids |
|  | SCF Sys Derivetied & Immobilized solvent materials |
| 9th |  | Introduction of Lubricants | 9 | Determination of surface tension of given liq. By using stalagmometer |
|  | Thick &Thin film mechanism |
|  | Classification of Lubricants Grease & its consistency & Drop Point |
| 10th |  | Properties of Lubricants, Viscosity & Viscosity Index Flash & Fire Pont | 10 | Determination of Flash & fire point of an oil by Pensky-Marten’s apparatus |
|  | Cloud & Power point, Iodine Number |
|  | Dry & Wet corrosion Electrochemical |
| 11th |  | Corrosion , Pitting & water line corrosion factor, affecting corrosion | 11 | Determination concentration of unknown K$M\_{n}$ $O\_{4}$ Solution by spectrophoto metrically |
|  | Prevention against corrosion cathodic & Anodic protection |
|  | Proper design & material selection |
| 12th |  | Engineering materials , ceremics | 12 | Determination of saponification value of a given oil sample |
|  | Clags silica , Feldspar porcelain |
|  | Cement-raw materials & Functions |
| 13th |  | Manufacturing of Portland Cement | 13 | Determination of PH of different Solutions by PH meter. Study of potentiometric titrations. |
|  | Analysis of Cement |
|  | Nanoscale material introduction |
| 14th |  | Properties of Nanomaterials | 14 | Determination of composition of a Liq. Mix by surface tension method |
|  | Nano crystals & Clusters |
|  | Fullerenes & their properties |
| 15th |  | Carbon Nanotubes & their uses | 15 | Revision of EDTA titration method for the hardness of water &b determination of Alkalinity of water |
|  | Nano wires , Nanocomposites |
|  | Revision of phase rule & water |