Name of Faculty : **Bhawna Rani**
Discipline : **Applied Science**
Semester : **II**
Subject : **APPLIED CHEMISTRY-II**
Lesson Plan Duration: 15 Week (From Jan 2018 to April 2018)
Work Load (Lecture/ Practical) per week (In hours): Lecture – 6, Practical – 12)

Week	Theory		Practical	
	Lecture Day	Topic(including assignment / test)	Practical Day	Topic
1st	1st	**Metallurgy:** General metallurgical terms and operations.	1st	Gravimetric analysis and apparatus used in gravimetric analysis
	2nd	General metallurgical terms and operations.		
	3rd	General metallurgical terms and operations with reference to iron,		
2nd	4th	General metallurgical terms and operations with reference to copper **Hand written Assignment:** List of iron, aluminium and copper metal ores and place of occurrences in India	2nd	Gravimetric estimation of moisture in the given coal sample (proximate analysis
	5th	General metallurgical terms and operations with reference to aluminium		
	6th	Manufacture of steel- Open hearth process. **Hand written Assignment:** Names of steel plants situated in India.		
3rd	7th	Alloys- definition and purpose of alloying,	3rd	Determination of percentage composition of volatile/non volatile matter in the given coal sample
	8th	Type of alloys – ferrous and nonferrous alloys, properties and applications of ferrous alloys- invar, nichrome, stainless steel, alnico		
	9th	properties and applications of non-ferrous alloys – brass, bronze, duralumin,magnalium and solder.		
4th	10th	Test	4th	VIVA-VOCE and practical checking
	11 th	**Corrosion and its Control:** Definition of corrosion, its types		
	12 th	Factors affecting corrosion rate, Theories of corrosion: Dry (chemical) corrosion- Pilling Bedworth rule		
5th	13 th	Theories of corrosion: Wet corrosion in acidic atmosphere by hydrogen evolution mechanism	5th	Gravimetric estimation of ash content in the given coal sample (proximate analysis)
	14 th	Definition of passivity in metals as per galvanic series		
	15 th	**Corrosion control**: Metal coatings – Cathodic protection(Sacrificial protection and impressed current voltage), Cementation on Base Metal Steel – Application of Metal Zn (Sheradizing),Cr (Chromozing) and Al (Calorizing),		
6th	16th	Inorganic coatings – Anodizing and phosphating, Organic coatings - use of paints varnishes and enamels	6th	Determination of viscosity of given liquid using Redwood viscometers
	17th	Internal corrosion preventive		

		measures- alloying (with reference to passivating, neutralizing and inhibition) and heat treatment (quenching, annealing)		
	18th	Test		
7th	19th	**Fuels:** Definition of fuel, classification of fuels, characteristics of good fuel	7th	VIVA-VOCE and practical checking
	20th	Relative merits of gaseous, liquid and solid fuels, Calorific value-higher calorific value, lower calorific value		
	21st	Determination of calorific value of solid or liquid fuel using Bomb calorimeter and numerical examples		
8th	22nd	Coal - types of coal and proximate analysis of coal	8th	Determination of flash point of given lubricating oil using Able's flash point apparatus
	23rd	Fuel rating – Octane number and Cetane number, fuel-structural influence on Octane and Cetane numbers		
	24th	Gaseous fuels – chemical composition, calorific value and applications of natural gas (CNG), LPG,		
9th	25 th	chemical composition, calorific value and applications of producer gas, water gas and biogas	9th	To study the effect of metal coupling on corrosion of iron
	26 th	Elementary ideal on – hydrogen as future fuels, nuclear fuels **Hand written Assignment** :Enlist hydro power plants and nuclear power plants in India.		
	27 th	Test		
10th	28 th	**Lubricants:** Definition of Lubricant and lubrication	10th	VIVA-VOCE and practical checking
	29 th	Type of lubrications –hydrodynamic, boundary lubrication with illustrative diagrams		
	30 th	Classification of lubricants –liquid lubricants, solid lubricants, semi-solid lubricants and synthetic lubricants with examples		
11 th	31st	Properties of lubricant Physical properties –viscosity and viscosity index, cloud point and pour point, flash point and fire point, oiliness.	11 th	Detection of iron metal in the given solution of rust(solution of rust in HCl be provided)
	32nd	Chemical properties- total acid value or number (TAV or TAN), carbon residue, emulsification factor and iodine value		
	33rd	Designation of lubricating oils according to Society of Automotive Engineers (SAE)		
12 th	34th	Cutting fluids – applications of cutting fluids, types and the factors that govern	12 th	Determination of percentage purity of commercial

		the selection of cutting fluids		sample of blue vitriol using N/20 $Na_2S_2O_3$.
	35 th	Test		
	36 th	**Engineering Materials and Refractories:** Definition and types with suitable examples and applications of- Ceramics		
13 th	37 th	Definition and types with suitable examples and applications of- Refractory and Composite materials	13 th	VIVA-VOCE and practical checking
	38 th	Glass-chemical composition and application of Soda, Borosilicate and lead glasses only		
	39 th	Paint- definition, constituents and advantages of these organic coatings		
14 th	40 th	Varnish and enamels- definition, constituents and advantages of these organic coatings	14 th	Practice
	41st	**Polymers and Plastics:** Definition of polymer, monomer and degree of polymerization		
	42nd	Brief introduction to addition polymers with suitable examples (PE, PS, PVC, Teflon)		
15 th	43rd	Brief introduction to condensation polymers with suitable examples (Nylon -66 and Bakelite)	15 th	Practice
	44 th	Definition of plastics, thermo plastics and thermo setting plastics with suitable examples, distinctions between thermo plastics and thermo settings		
	45 th	Applications of polymers in industry and daily life		