BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI HYDERABAD CAMPUS
INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout (Part II)

Date: 01/08/2016

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **CHE F214**
Course Title : **Engineering Chemistry**
Instructor-in-charge : Srikanta Dinda
Tutorial Instructor : Srikanta Dinda

1. Course Description: It deals with basic principles of various branches of chemistry like physical, inorganic, organic , analytical and material chemistry.

2. Scope & Objective: It aims to impart students an in-depth knowledge of various aspects of chemistry as applied to engineering. The course also aims to bridge the theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in the field of Chemical engineering.

3. Text Books:

TB: Dr Suba Ramesh and others, Engineering Chemistry, Wiley India, 2011,1st Ed.

4. Reference Books:

R1: P. W. Atkins, Elements of physical chemistry, 8th edition, Oxford University Press

R2: T. W. Graham Solomons and Craig B. Fryhle, Organic Chemistry, 9th edition, John Wiley and sons

R3: Perry and Green, Perry's Chemical Engineers' Handbook, 9th Edition, Section 2, McGraw Hill

R4: Dr S. S. Dara and Dr S. S. Umare, A Text book of Engineering Chemistry, S. Chand& Company Ltd,2000 1st Ed.

5. Course Plan:

L N	Topic	Learning objectives	Test book chapter
1-2	Introduction	Atom and its constituents, electronic configuration, electronegativity, dipoles, hydrogen bonding,	TB-1
3-5	Important Functional groups and their reactions	Alcohols, carboxylic acids, amines, aldehydes and ketones, ethers.	TB-9
6-9	Some Name reactions	Epoxy-catalysis crosslink reaction, Fridel-Craft acylation, Aldol condensation, Cannizzaro reaction, Hofmann rearrangement, Diels-Alder reaction, Beckmann rearrangement	TB-9
10-14	Thermo-physical and thermo dynamic properties determination	Prediction and correlation of physical properties: Heat capacity, Enthalpy of vaporization and fusion, thermal conductivity, diffusivity, Flammability, density, viscosity and surface tension properties	TB-4
15-16	Phase Rule	Phase rule, Phase diagram, one-component and two component systems	TB-6
17-19	Adsorption	Introduction to adsorption process, Adsorption isotherms, Equilibrium relation for adsorbents, Breakthrough concentration curves, Applications of Adsorption.	TB-8
20-22	Electrochemistry	Types of electrolytes, Electrochemical cells, Electrode potential, Galvanic cells, Nerst equation, Measurement of EMF, types of electrodes, Batteries	TB-7
23-24	Chemical Methods of analysis	Volumetric analysis, Redox titrations, Complexometric titrations	
25-28	Instrumental Methods of analysis	Infrared spectroscopy, NMR spectroscopy, UV-Visible spectroscopy, Chromatography, particle size analyzer	TB-11
29-33	Engineering Materials	Cementing materials-Lime, Cement, Gypsum, Refractories, Insulators, Lubricants	TB-14
34-35	Metal and Alloys	Physical properties of metals, Chemical characteristics, Iron, Steel, Alloys, Alloys of steel.	TB-15
36-37	Polymers	Classification of Polymers, Types of polymerization, Molecular weight of polymers, plastics, some important commercial thermoplastics ad thermosetting resins, Elastomers, Synthetic rubbers, Fibres.	TB-13
38-39	Fuel and fuel analysis	Solid, liquid and gaseous Fuel, caloric value, fuel analysis	TB-16
40-41	Corrosion	Types of corrosion, Factors influencing rate of corrosion, Corrosion control methods, Protective coatings,	TB-18

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date, Time	Remarks
Test I	60 mins	25	13/9, 4.00--5.00 PM	CB
Test II	60 mins	25	21/10, 4.00--5.00 PM	CB
Compre Exam	3 hrs	40	13/12 FN	20%CB +20%OB
Assignments/ quiz	-	10		

Closed Book Test: No reference material of any kind will be permitted inside the exam hall.

Open Book Exam: Any printed material will be permitted. Loose papers will not be permitted. No exchange of any material will be allowed.

Chamber Consultation Hour: To be announced in the class.

Notices: All notices related to the courses will be displayed on Chem. Engg Notice Board or CMS

Make-up Policy: Make-up for the test (test-1 and test-2) may be granted with prior permission from the Instructor-in-charge.

Srikanta Dinda

Instructor-in-charge
CHE F214