

Course Number and Name	
BCH201 - ENGINEERING CHEMISTRY II	
Credits and Contact Hours	
3 & 45	
Course Coordinator's Name	
MS.Madhubala	
Text Books and References	
<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi (2002). 2. S.S.Dara "A text book of Engineering Chemistry" S.Chand &Co.Ltd., New Delhi (2006). 3. P. J. Lucia, M. Subhashini, "Engineering Chemistry, Volume 1", Crystal Publications, Chennai, (2007). <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. B.Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub. Co.Ltd, New Delhi,(2008) 2. B.K.Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001). 3. http://ocw.mit.edu/courses/find-by-topic 4. http://nptel.ac.in/course.php?disciplineId=122 5. https://en.wikipedia.org/wiki/Spectroscopy 	
Course Description	
To impart a sound knowledge on the principles of chemistry involving application oriented topics required for all engineering branches.	
Prerequisites	Co-requisites
ENGINEERING CHEMISTRY I	Nil
required, elective, or selected elective (as per Table 5-1)	
Required	
Course Outcomes (COs)	
CO1	Students will understand the concepts and further industrial applications of surface chemistry
CO2	To impart knowledge about the Industrial importance of Phase rule and alloys
CO3	To make the students to be conversant with Analytical techniques of chemistry and t importance
CO4	To have an idea and knowledge about the Chemistry of Fuels and
CO5	Understanding of engineering materials
CO6	All about bonding and molecular structures

Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	H	H	L		H		H				M	
CO2		H			H		H					
CO3	H		L		H		H				M	
CO4			L		H		H					
CO5			L		H		H					
CO6			L		H		H		H		M	
List of Topics Covered												
UNIT I SURFACE CHEMISTRY											9	
<p>Introduction : Adsorption , absorption , desorption , adsorbent , adsorbate and sorption – (definition only) Differences between adsorption and absorption Adsorption of gases on solids – factors affecting adsorption of gases on solids – Adsorption isotherms –Frendlich adsorption isotherm and Langmuir adsorption isotherm Role adsorbents in catalysis, Ion-exchange adsorption and pollution abatement.</p>												
UNIT II PHASE RULE AND ALLOYS											9	
<p>Introduction :Statement of Phase Rule and explanation of terms involved – one component system – water system – Construction of phase diagram by thermal analysis - Condensed phase rule [Definition only] Two Component System : Simple eutectic systems (lead-silver system only) – eutectic temperature – eutectic composition – Pattinsons Process of desilverisation of Lead Alloys: Importance, ferrous alloys –nichrome and stainless steel – 18/8 stainless steel -heat treatment of steel – annealing – hardening – tempering normalizing – carburizing - nit riding . Non- ferrous alloys: Brass and Bronze</p>												
UNIT III ANALYTICAL TECHNIQUES											9	
<p>Introduction: Type of Spectroscopy - Atomic spectroscopy – molecular spectroscopy - Explanation IR spectroscopy – principles – instrumentation (block diagram only) – applications - finger print region UV-visible spectroscopy — principle – instrumentation (block diagram only) – Beer-Lambert's law- – estimation of iron by colorimetry– Atomic absorption spectroscopy- principle - instrumentation (block diagram only) - estimation of Nickel by Atomic absorption spectroscopy Flame photometry– principles – instrumentation (block diagram only) estimation of sodium ion by Flame photometry</p>												
UNIT IV FUELS											9	
<p>Introduction : Calorific value – types of Calorific value - gross calorific value – net calorific value Analysis of Coal Proximate and ultimate analysis – hydrogenation of coal - Metallurgical coke – manufacture by Otto-Hoffmann method Petroleum processing and fractions – cracking – catalytic cracking – types – fixed bed catalytic cracking method- Octane number and Cetane number (definition only) Synthetic petrol – Bergius processes – Gaseous fuels- water gas, producer gas, CNG and LPG (definition and composition only) Flue gas analysis – importance - Orsat apparatus</p>												

Introduction: Refractory's – classification – acidic, basic and neutral refractory's – properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) Manufacture of Refractory's: alumina bricks and Magnesite bricks, Abrasives – natural and synthetic abrasives Natural type : Siliceous - quartz ; Non – siliceous – diamond Synthetic Abrasives : silicon carbide and boron carbide. Lubricants: Liquid lubricants - Properties – viscosity index, flash and fire points, cloud and pour points, oiliness) Solid lubricants – graphite and molybdenum sulphide