

Course Number and Name												
<b>BCH 201 - ENGINEERING CHEMISTRY-II</b>												
Credits and Contact Hours												
<b>3 &amp; 45</b>												
Course Coordinator's Name												
<b>Ms.Madhubala</b>												
Text Books and References												
<b>TEXT BOOKS:</b>												
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).												
<b>REFERENCES:</b>												
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).												
Course Description												
<ul style="list-style-type: none"> <li>To impart a sound knowledge on the principles of chemistry involving application oriented topics required for all engineering branches.</li> </ul>												
Prerequisites						Co-requisites						
ENGINEERING CHEMISTRY -I						NIL						
required, elective, or selected elective (as per Table 5-1)												
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 their 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
	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	
<b>UNIT I</b>	<b>SURFACE CHEMISTRY</b>
	<b>9</b>
<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 –Freundlich adsorption isotherm and Langmuir adsorption isotherm Role of adsorbents in catalysis, Ion-exchange adsorption and pollution abatement.</p>	
<b>UNIT II</b>	<b>PHASE RULE AND ALLOYS</b>
	<b>9</b>
<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 - nitriding . Non- ferrous alloys: Brass and Bronze</p>	
<b>UNIT III</b>	<b>ANALYTICAL TECHNIQUES</b>
	<b>9</b>
<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>	
<b>UNIT IV</b>	<b>FUELS</b>
	<b>9</b>
<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>	
<b>UNIT V</b>	<b>ENGINEERING MATERIALS</b>
	<b>9</b>
<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</p>	