

Department of Chemistry

EEE A, B & CSE-A

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN for 1 st Year B.Tech (EEE-A&B,CSE-A)			
Course Title	CHEMISTRY - II		
Course Code	CHIR13	No. of Credits	4 (Theory-3+Lab-1)
Department	CHEMISTRY	Faculty	Dr.S.VAIDEESWARAN
Pre-requisites Course Code	Nil		
Course Coordinator(s) (if, applicable)	Dr.L.Cindrella (Theory) Dr.S.Velmathi (Practicals)		
E-mail	vaideeswaran@nitt.edu vaidees_2010@yahoo.com	Telephone No.	9597231200
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
COURSE OVERVIEW			
This course is common to all the I year B.Tech - circuit branch students. This credit course is a combination of (3 credit) and practicals(1 credit). Three theory classes will be conducted per week and one lab class (3h) will be conducted in alternate week.			
COURSE OBJECTIVES			
To introduce the students to basic principles of electrochemistry, cell construction and evaluation, electrochemical power sources, the importance of corrosion in metal/alloy and polymer.			
COURSE OUTCOMES (CO)			
Students would become familiar with			
<ul style="list-style-type: none"> ✓ Electrochemistry and its important practical applications. ✓ Corrosion-types and mechanism and also methods of protection. ✓ Batteries - Principles and uses. ✓ Solids, their properties and applications. ✓ Polymer materials. 			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	1 st WEEK (Starts 18.1.17)	Electrochemistry Conductivity of electrolytes- Specific, molar and equivalent conductivity, Nernst equation for electrode potential, EMF series, hydrogen electrode.	C&T,PPT
2	2 nd WEEK	Calomel electrode, glass electrode, Electrolytic and galvanic cells, cell EMF, its measurement and applications, Weston standard cell, reversible and irreversible cells.	C&T,PPT

3	3 rd WEEK	Concentration cell, electrode (hydrogen gas electrode) and electrolyte concentration cell, concentration cell with and without transference. Corrosion Dry corrosion and wet corrosion, mechanisms, types of corrosion.	C&T,PPT
4	4 th WEEK	DMC, DAC, stress, inter granular, atmospheric and soil corrosion, Passivity, Polarization, over potential and its significance	C&T,PPT
5	5 th WEEK	Factors affecting corrosion, protection from corrosion by metallic coatings, electroplating, electroless plating and cathodic protection.	C&T,PPT
6	6 th WEEK	Chemical conversion coatings and organic coatings- Paints, enamels. Batteries Different types of batteries. Primary, Secondary & Flow battery and Fuel cell.	C&T,PPT
7	7 th WEEK	Fuel cell-Working principle and uses-Laclanche cell, alkaline battery. Ni-Cd battery, lithium battery & Mercury battery.	C&T,PPT
8	8 th WEEK	Fuel cell- Theory, working and application. Different types of fuel cells-H ₂ /O ₂ , propane-oxygen,PEFC and SOFC. Lead Acid storage cell-charging & discharging principle, operation and uses.	C&T,PPT
9	9 th WEEK	Solar battery- its working principle. Solid State Types of solids - close packing of atoms and ions	C&T,PPT
10	10 th WEEK	- bcc, fcc structures of rock salt - cesium chloride-spinel - normal and inverse spinels. Stoichiometric Defect, controlled valency & Chalcogen semiconductors, Non-elemental semiconducting Materials.	C&T,PPT
11	11 th WEEK	Preparation of Semiconductors-steps followed during the preparation of highly pure materials and further treatments.	C&T,PPT
12	12 th WEEK	Semiconductor Devices-p-n junction diode. Polymer Nomenclature, functionality.	C&T,PPT
13	13 th WEEK	Classification, methods of polymerization, mechanism of polymerization, molecular weight determination-Viscometry, light scattering methods.	C&T,PPT
14	14 th WEEK	Plastics-Moulding constituents of a plastics and moulding of plastics into articles. Important thermoplastics and thermosetting resins.	C&T,PPT
15	15 th WEEK	Synthesis & applications of PVA, FLUON, PC, Kevlar, ABS polymer, phenolic & amino resins,	C&T,PPT

		epoxy resins and polyurethanes.		
16	16 th WEEK	Conductive polymers		C&T,PPT
COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
Theory				
1	Assignment	3rd week	10 days from the announced day	5
2	Test I	6 th week	50 minutes	20
3	Quiz	9 th week	50 minutes	5
4	Test II	12 th week	50 minutes	20
5	Final assessment	17 th -19 th week	3 hours	50
Practical				
6	Regular class experiments	All practical classes	3 hours per experiment	100
Theory (75 %)+Practical (25%)=100 Marks				
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				
Text Books				
1. P. C. Jain and M. Jain, 'Engineering Chemistry', Dhanpat Rai Publishing Company, New Delhi, 2005.				
2. B.R. Puri, L.R. Sharma, M.S. Pathania, 'Principles of Physical Chemistry', Vishal Publishing Company, 2008.				
3. J. D. Lee, 'Concise Inorganic Chemistry', 5th Edn., Chapman and Hall, London, 1996.				
Reference Books				
1. S. S. Dara, S. S. Umare, 'A Text Book of Engineering Chemistry', S. Chand Publishing, 2011.				
2. F.W. Billmeyer. 'Textbook of Polymer Science', 3rd Edn, Wiley. N.Y. 1991.				
3. A.R. West, 'Basic Solid State Chemistry', 2nd edition, John Wiley and Sons, 1999.				
COURSE EXIT SURVEY				
1. Feedback from students during class committee meetings.				
2. Anonymous feedback through questionnaire.				
COURSE POLICY				
1. Test I and II will be conducted in regular class.				
2. The question paper for end semester examination will be set by the teacher.				
3. Each experiment will be evaluated for 20 marks.				
4. There will be no semester examination for practical.				
5. One extra class will be conducted for those who missed any experiment due to ill health or OD reasons.				
6. 75% attendance is compulsory for writing the end semester exam.				
7. Students with 60% attendance need to attend extra classes to become eligible for writing the exam. Students with below 60% attendance need to redo the course.				
8. Student absent for Test 1 and Test 2 on genuine reason may be considered for a retest of same weightage but the entire syllabus covered up to Test-2 before the final assessment.				

ADDITIONAL COURSE INFORMATION
The faculty will be available for consultation at times as per the intimation by the faculty. Students can get prior permission by contacting the faculty through either by e-mail or phone.
FOR SENATE'S CONSIDERATION
Dr. S. VAIDEESWARAN - <u>S. Vaidees</u>
Course Coordinator <u><i>Almirella</i></u> <u>12/1/12</u> CC-Chairperson <u><i>Br...</i></u> <u>12/1/12</u> HOD <u><i>Almirella</i></u> <u>12/1/12</u>