

Department of Chemistry

ICE - B

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN (Instrumentation and Control Engineering Section-B)			
Course Title	Chemistry II		
Course Code	CHIR 12(B) CHEMISTRY - II	No. of Credits	4 (Theory - 3 + Lab - 1)
Department	Chemistry	Faculty	Dr. M. MARY SHEEBA
Pre-requisites Course Code	NIL		
Course Coordinator(s) (if, applicable)	Dr. L. CINDRELLA (Theory) Dr. S. VELMATHI (Lab)		
E-mail	sheebachem88@gmail.com	Mobile No.	9445969165
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
COURSE OVERVIEW			
<p>This is a four credit course offered to I year B.Tech Instrumentation and Control Engineering. This course is a combination of theory (3 credit) and practicals (1 credit). Three theory classes will be conducted per week and one lab session (3 hours) will be held during alternate weeks. This course provides a thorough understanding of the subject through lectures, tutorials, course work and demonstrations.</p>			
COURSE OBJECTIVE			
<p>To introduce the basic principles, importance and applications of electrochemistry, corrosion, cell construction and evaluation, electrochemical power sources, the importance of corrosion in metal/alloy and polymer and solid state chemistry principles to the students.</p>			
COURSE OUTCOMES (CO)			
<p>Students will become familiar with the following aspects:</p> <ul style="list-style-type: none"> ✓ Fundamentals of electrochemistry, its significance and applications ✓ Mechanism and types of corrosion, factors affecting corrosion, and methods of protection. ✓ Battery materials and applications ✓ Solid state chemistry -fundamental concepts ✓ Concepts of macromolecules. 			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	III week of January	<p>A brief introduction about the course and syllabus will be discussed.</p> <p>Unit-I Conductivity of electrolytes, specific, molar and equivalent conductivity, Nernst equation, EMF series</p>	C&T, PPT

2	IV week of January	Hydrogen, calomel & glass electrodes, electrolytic & Galvanic cells, cell EMF (measurement & applications)	C&T, PPT
3	I week of February	Weston standard cell, reversible and irreversible cells, concentration cell, electrode and electrolyte concentration cell.	C&T, PPT
4	II week of February	Unit-II Dry & wet corrosion, mechanisms, types of corrosion (DMC, DAC, stress, intergranular, atmospheric and soil)	C&T, PPT
5	III week of February	Passivity, polarization, over potential and its significance, factors affecting corrosion, protection from corrosion	C&T, PPT
6	IV week of February	Electroplating, electrolessplating, cathodic protection, chemical conversion and organic coatings	C&T, PPT
7	I week of March	Unit-III Different types of batteries-Primary, Secondary & Flow battery and Fuel cell. Working principle and uses-Laclanche cell, alkaline battery, nicad battery, lithium battery & Mercury battery	C&T, PPT
8	II week of March	Fuel cell- Theory, working and application. Different types of fuel cells-H ₂ /O ₂ , propane-oxygen, PEFC and SOFC	C&T, PPT
9	III week of March	Lead Acid storage cell-charging & discharging principle, operation and uses. Solar battery- its working principle.	C&T, PPT
10	IV week of March	Unit-IV Types of solids - close packing of atoms and ions - bcc, fcc structures of rock salt - cesium chloride-spinel - normal and inverse spinels.	C&T, PPT
11	I week of April	Stoichiometric Defect, controlled valency & Chalcogen semiconductors, Non-elemental semiconducting Materials.	C&T, PPT
12	II week of April	Preparation of Semiconductors-steps followed during the preparation, of highly pure materials and further treatments. Semiconductor Devices-p-n junction diode	C&T, PPT
13	III week of April	Unit-V Nomenclature, functionality, classification, methods of polymerization, mechanism of polymerization, molecular weight determination -Viscometry, light scattering methods	C&T, PPT
14	IV week of April	Plastics-Moulding constituents of a plastics and moulding of plastics into articles. Important thermoplastics and thermosetting resins	C&T, PPT

15	I week of May	Synthesis & applications of PVA FLUON, PC, Kevlar, ABS polymer, phenolic & amino resins, epoxy resins and polyurethanes. Conductive polymers	C&T, PPT	
COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
Theory				
1	Assignment/Quiz	I week of Feb	50 minutes	5
2	Test I	III week of Feb	50 minutes	20
3	Seminar	II week of March	1 week	5
4	Test II	I week of April	50 minutes	20
5	End Semester	II week of May	3 hours	50
Practical				
6	Regular class experiments	All practical classes	3 hours per experiment	25
Theory (75) + Practical (25) = Total (100)				
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				
Text Books				
1. P. C. Jain & 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.				
Reference Books				
1. F.W. Billmeyer. 'Textbook of Polymer Science', 3rd Edn, Wiley. N.Y. 1991.				
2. S. S. Dara, S. S. Umare, 'A Text Book of Engineering Chemistry', S. Chand Publishing, 2011				
COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)				
1. Feedback from students during class committee meetings.				
2. Anonymous feedback through questionnaire at the end of the semester.				
COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)				
1. Test I and II will be conducted during assessment period II and IV respectively.				
2. Each lab experiment will be evaluated for 5 marks.				
4. There will be no final assessment for practical.				
5. One extra class will be conducted for those who missed any experiment due to ill health or any other genuine reasons.				
6. Retest will be conducted for students who do not appear for the test I & II due to ill health or any other genuine reasons.				
7. 75% attendance is compulsory for writing the end semester exam.				
ADDITIONAL COURSE INFORMATION				
The faculty will be available for consultation at times as per the intimation by the faculty. Students can get prior permission either through email: sheebachem88@gmail.com or mobile no.: 9445969165				
<p>M. Marysheela Dr. M. Mary Sheeba (TTA) Coordinator <i>Marysheela</i> CC-Chairperson <i>Marysheela</i> 17/1/17</p> <p><i>Marysheela</i> 18/1/17 HOD <i>Marysheela</i> 17/1/17</p>				