

Chem & MME

Department of Chemistry

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN			
Course Title	Chemistry II		
Course Code	CHIR14	No. of Credits	4 (Theory + Lab)
Department	Chemistry	Faculty	Dr. R. Karvembu (Theory/CHL) Dr. A. Sreekanth (Theory/MME) Dr. S. Saravanamoorthy (Lab/CHL&MME)
Programme	B.Tech. (Chemical & MME)		
Pre-requisites	Nil		
Course Code			
Course Coordinator	Dr. R. Karvembu		
E-mail	kar@nitt.edu sreekanth@nitt.edu saraartudc@gmail.com	Telephone No.	2503636 2503642
Course Type	<input checked="" type="checkbox"/> Core course	GIR	
COURSE OVERVIEW			
This course is offered to I year B.Tech. MME & CHL students. This 4 credit course is a combination of theory and practicals. Three theory classes will be conducted per week and one lab class (3 h) will be conducted in alternate week.			
COURSE OBJECTIVE			
To introduce the basic principles of electrochemistry, corrosion, spectroscopy, metals, alloys, polymers and composites to the I year B.Tech. (MME & CHL) students.			
COURSE OUTCOMES (CO)			
Students would become familiar with the			
<ul style="list-style-type: none"> ✓ importance of electrochemistry and its applications ✓ causes, consequences and protection methods of corrosion ✓ spectroscopic techniques for characterization of materials ✓ principles of metal extraction and purification ✓ production and applications of alloys, polymers and composites 			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	III week of Jan	<u>Unit-I</u> Conductivity of electrolytes, specific, molar and equivalent conductivity, Nernst equation, EMF series	C&T, PPT
2	IV week of Jan	Hydrogen, calomel & glass electrodes, electrolytic & Galvanic cells, cell EMF (measurement & applications)	C&T, PPT

3	I week of Feb	Weston standard cell, reversible and irreversible cells, concentration cell, electrode and electrolyte concentration cell, Fuel cells, hydrox fuel cell	C&T, PPT	
4	II week of Feb	Unit-II Dry & wet corrosion, mechanisms, types of corrosion (DMC, DAC, stress, intergranular, atmospheric and soil)	C&T, PPT	
5	III week of Feb	Passivity, polarization, over potential and its significance, factors affecting corrosion, protection from corrosion	C&T, PPT	
6	IV week of Feb	Electroplating, electrolessplating, cathodic protection, chemical conversion and organic coatings	C&T, PPT	
7	I week of March	Unit-III Spectroscopy, Born-Oppenheimer approximation, IR spectroscopy, instrumentation & applications, Franck-Condon principle		
8	II week of March	Electronic spectroscopy, theory, instrumentation, Beers law, Woodward-Fieser rules	C&T, PPT	
9	III week of March	NMR spectroscopy, shielding & deshielding, chemical shift, applications, AAS & AES, fundamentals	C&T, PPT	
10	IV week of March	Unit-IV Metals, properties, theories, metallurgy, isolation & purification of metals, thermodynamics of reduction processes	C&T, PPT	
11	I week of April	Isolation of Ni, Cr, W, U & Fe, heat treatment of steel, powder metallurgy, alloy steels	C&T, PPT	
12	II week of April	Thermal analysis, TG, DTA, DSC	C&T, PPT	
13	III week of April	Unit-V Polymers, nomenclature, tacticity, polymerization processes, mechanisms, types of polymerization, classification	C&T, PPT	
14	IV week of April	Effect of structure on properties, moulding, important polymers, synthesis & properties	C&T, PPT	
15	I week of May	Molecular mass determination, rubbers, vulcanization, synthetic rubbers, conducting polymers, composites, reinforced composites	C&T, PPT	
COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
Theory				
1	Assignment	I week of Feb	One week	5
2	Test I	IV week of Feb	50 minutes	15
3	Activity based on spectrometers	III week of March	One week	5
4	Test II	II week of April	50 minutes	15

5	Practicals	III week of Jan to I week of May	Each lab will be of 3 h	20
6	Test III (end semester)	II week of May	3 hours	40
Total				100

Details about assessments 2 and 4:

- ✓ For those who missed Test I and Test II due to genuine reasons, retest will be conducted during the I week of May 2017.

Details about assessment 5 (practicals):

- ✓ Each experiment will be evaluated for 20 marks.
- ✓ Students have to do a minimum of 5 experiments.
- ✓ The total 100 marks will be converted into 20%.
- ✓ There will be no final assessment for practical.
- ✓ One extra class will be conducted for those who missed any experiment due to ill health or OD reasons.

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

1. Engineering Chemistry, P.C. Jain & M. Jain, Dhanpat Rai Publishing Company, New Delhi, 2012
2. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma & M.S. Pathania, Vishal Publishing Company, 2008
3. Textbook of Polymer Science, F.W. Billmeyer, Wiley, New York, 1991
4. Fundamentals of Molecular Spectroscopy, C.N. Banwell & E.M. McCash, Tata McGraw Hill, 1995
5. A Textbook of Engineering Chemistry, S.S. Darer & S.S. Umare, 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.)

Attendance:

- ✓ 75% attendance is compulsory for appearing assessment 6 (end semester).
- ✓ Those who have 60-74% attendance (as on 28th April 2017) have to attend additional evening hour classes during the I week of May 2017 to become eligible to appear for assessment 6.
- ✓ Those who have <60% attendance have to redo the course and their grades will be 'V'.

ADDITIONAL COURSE INFORMATION

The faculty will be available for consultation at times as per the intimation by the faculty.

Coordinator N. K. Gaur 10/11/17 CC-Chairperson Shruti HOD Khushi 11/1/17