Department of Chemistry

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	**Chemistry I**		
Course Code	**CHIR 11**	**No. of Credits**	**3 (Theory -2 + Lab -1)**
Department	**Chemistry**	**Faculty**	**All faculty members of the Department**
Pre-requisites Course Code	**NA**		
Course Coordinator(s) (if, applicable)	**Dr. S. Anandan (Theory)** **Dr. S. Velmathi (Lab)**		
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Course Type	☑ **Core course** ☐ **Elective course**		

COURSE OVERVIEW

This course is common to all the I year B.Tech. students. This 3 credit course is a combination of theory (2 credit) and practicals (1 credit). Two theory classes will be conducted per week and one lab class (3 h) will be conducted in alternate week.

COURSE OBJECTIVE

To introduce water chemistry, bonding concepts, entropy, fuels and lubricants to the I year B.Tech. students.

COURSE OUTCOMES (CO)

Students will learn about quality of water, bonding theories, entropy change for various processes and basic aspects of fuels and lubricants.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	**Week**	**Topic**	**Mode of Delivery**
1	II week of Aug	**<u>Unit-I</u>** Sources, hard & soft water, estimation of hardness	C&T, PPT
2	III week of Aug	Processes for softening of water, boiler feed water	C&T, PPT
3	IV week of Aug	Internal treatment methods, specifications for drinking water, various standards	C&T, PPT
4	I week of Sep	Treatment of water **<u>Unit-II</u>** Bonding in metals	C&T, PPT
5	II week of Sep	Theory and properties, alloy and its types	C&T, PPT

6	III week of Sep	Coordinate bond, electron counting methods		C&T, PPT
7	IV week of Sep	Crystal field theory		
8	I week of Oct	**Unit-III** Lewis and VSEPR theories, consequences of shape and dipole moment		C&T, PPT
9	II week of Oct	Valence bond theory		C&T, PPT
10	III week of Oct	Various intermolecular interactions, relative strength, consequences		C&T, PPT
11	IV week of Oct	**Unit-IV** Entropy changes for various processes		C&T, PPT
12	I week of Nov	Work and free energy functions, Helmholtz and Gibbs free energy functions		C&T, PPT
13	II week of Nov	Gibbs-Helmholtz, Gibbs-Duhem and Clapeyron-Clausius equations & their applications		C&T, PPT
14	III week of Nov	Van't Hoff isotherm **Unit-V** Classification of fuels, merits		C&T, PPT
15	IV week of Nov	Coal, calorific value, theoretical oxygen requirement for combustion		C&T, PPT
16	I week of Dec	Analysis of coal, metallurigical coke, flue gas analysis		C&T, PPT
17	II week of Dec	Theories of lubrication, characteristics of lubricants, additives, solid lubricants		C&T, PPT
COURSE ASSESSMENT METHODS				
S.No.	**Mode of Assessment**	**Week/Date**	**Duration**	**% Weightage**
Theory				
1	Quiz/seminar/G.D./ assignment	I week of Sep	Depends on the activity	5
2	Test I	IV week of Sep	50 minutes	20
3	Quiz/seminar/G.D./ assignment	III week of Oct	Depends on the activity	5
4	Test II	III week of Nov	50 minutes	20
5	End semester		3 hours	50
Practical				
6	Regular class experiments	All practical classes	3 hours per experiment	100
Theory (66.7) + Practical (33.3) = Total (100)				
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. Physical Chemistry, P. Atkins & J.D. Paula, Oxford University Press, 2002
3. Modern Inorganic Chemistry, R.D. Madan, S. Chand & Company Ltd., New Delhi, 2012
4. Engineering Chemistry, M.J. Shultz, Cengage Learning, New Delhi, 2007

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 (as followed previously).

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

1. Test I and II will be conducted in regular class.
2. The question paper for end semester examination will be set by the respective 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.

ADDITIONAL COURSE INFORMATION

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

Coordinator _____ **CC-Chairperson** _____ **HOD** _____