Department of Chemistry

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	Chemistry-I		
Course Code	CHIR11	No. of Credits	3 (Theory -2 + Lab -1)
Department	Chemistry	Faculty	Dr. M. P. Karthikayini (ECE - B)
Course Coordinator (if, applicable)	Dr. V.M. Biju (Theory & Practical)		
E-mail	vmbiju@nitt.edu karthikayini.mp@gmail.com	Telephone No.	09443843076 (VMB) 08903017760 (MPK)
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 and practicals. 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	**Unit-I** Sources, hard & soft water, estimation of hardness	C&T, PPT
2	III week of August	Processes for softening of water, boiler feed water	C&T, PPT
3	IV week of August	Internal treatment methods, specifications for drinking water, various standards	C&T, PPT
4	I week of September	Treatment of water **Unit-II** Bonding in metals	C&T, PPT
5	II week of September	Theory and properties – alloy and its types	C&T, PPT
6	III week of September	Coordinate bond, electron counting methods	C&T, PPT
7	IV week of September	Crystal field theory	C&T, PPT
8	I week of October	**Unit-III** Lewis and VSEPR theories, consequences of shape and dipole moment	C&T, PPT

9	II week of October	Valence bond theory	C&T, PPT
10	III week of October	Various intermolecular interactions, relative strength, consequences	C&T, PPT
11	IV week of October	**Unit-IV** Entropy changes for various processes, Work and free energy functions	C&T, PPT
12	I week of November	Helmholtz and Gibbs free energy functions, Gibbs-Helmholtz and Gibbs-Duhem equation	C&T, PPT
13	II week of November	Clapeyron Clausius equation with its applications and Van't Hoff isotherm	C&T, PPT
14	III week of November	**Unit-V** Classification of fuels with its merits and Coal, calorific value, theoretical oxygen requirement for combustion	C&T, PPT
15	IV week of November	Analysis of coal, metallurigical coke, flue gas analysis	C&T, PPT
16	I week of December	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	Assignment	IV week of Aug	One week	5
2	Test I	IV week of Sep	50 minutes	10
3	Assignment	III week of Oct	One week	5
4	Test II	III week of Nov	50 minutes	10
5	Final Asessment	III week of Dec	3 hours	40
Practical				
6	Regular class experiments	All practical classes	3 hours per experiment	30

Theory (70) + Practical (30) = 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. 75% attendance is compulsory for both theory and lab components.
2. Lab:

a) Each experiment will be evaluated for 6 marks.

b) There will be no final assessment for practical.

c) One extra class will be conducted for those who missed any experiment due to ill health or OD reasons.

3. Theory:

a) Those who have <75% attendance (as on 01st December 2017) have to attend additional evening hour classes during the I week of December 2017 to become eligible to appear for assessment 5 (Final assessment).
b) For those who missed Test I and Test II due to genuine reasons, retest will be conducted during the I week of December 2017.

ADDITIONAL COURSE INFORMATION

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

Coordinator _____ **CC-Chairperson** _____ 9/8/17 **HOD** _____ 9/8/17

(DR. L. CINDRELLA)

M.P. Karthikayini 9/Aug/17.

(M.P. KARTHIKAYINI).