



**DEPARTMENT OF CHEMISTRY**  
**NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI**

<b>COURSE PLAN</b>			
<b>Course title</b>	<b>Environmental Chemistry</b>		
<b>Course code</b>	<b>CH 627</b>	<b>No. of Credits</b>	<b>3</b>
<b>Department</b>	<b>Chemistry</b>	<b>Faculty</b>	<b>Dr. M.P. Karthikayini</b>
<b>Course type</b>	<b>Elective course</b>		
<b>Course Coordinator(s) (if, applicable)</b>	<b>Dr. M.P. Karthikayini</b>		
<b>E-mail:</b>	<b>karthikayini.mp@gmail.com</b>	<b>Phone:</b>	<b>9791284021</b>
<b>COURSE OVERVIEW</b>			
This is an elective course offered for the II-M.Sc students. Three credits are awarded for the course. Three lectures will be conducted every week.			
<b>COURSE OBJECTIVE</b>			
To introduce the underlying concepts of Environmental Chemistry, various aspects of the four main spheres of earth: Atmosphere, Biosphere, Hydrosphere and Lithosphere, their interactions amongst each other and influence on human beings to the II-M.Sc students.			
<b>COURSE OUTCOMES (CO)</b>			
Students will become familiar with the basics of Environmental chemistry and its numerous facets; cause of pollution, its analysis and control.			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>Sl.No.</b>	<b>Week</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	II-week Jul/2017	<b>Unit I- Scope:</b> Environmental pollution - structure of atmosphere - biogeological cycles - oxygen -nitrogen – carbon – phosphorous – sulphur - biodistribution of elements	C&T, PPT
2	III-week Jul/2017	air pollutions - reactions in atmosphere - primary pollutants - air quality standards - analysis of CO, nitrogen oxides, sulphur oxides, hydrocarbons and particulate matter - particulate pollution - control methods - vehicular pollution	C&T, PPT
3	IV-week Jul/2017	greenhouse effect and global warming - climatic changes – ozone - photochemical smog - acid rain - sampling - monitoring – control.	C&T, PPT



	I-week Aug/2017	<b>Unit II Hydrosphere:</b> Water pollution - hydrological cycle - chemical composition - sea water composition - water quality criteria for domestic and industrial uses - BIS and WHO standards	C&T, PPT
5	II-week Aug/2017	ground water pollution - surface water pollution - lake and river water - eutrophication - marine pollution - water pollutants	C&T, PPT
6	III-week Aug/2017	biodgradability of detergents – pesticides - endosulfan and related case studies.	C&T, PPT
7	IV-week Aug/2017	<b>Unit III-Classification of industrial waste waters:</b> Principles of water and waste water treatment - aerobic and anaerobic treatment - industrial waste water treatment	C&T, PPT
8	I-week Sep/2017	heavy metal pollution -hard water - softening - purification of water for drinking purposes - water treatment for industrial use	C&T, PPT
9	II-week Sep/2017	electrodialysis - reverse osmosis - other purification methods - chemical speciation of elements.	C&T, PPT
10	III-week Sep/2017	<b>Unit IV-Water analysis:</b> Color - odor - conductivity - TDS - pH - acidity - alkalinity - chloride -residual chlorine - hardness - trace metal analysis	C&T, PPT
11	IV-week Sep/2017	elemental analysis - ammonia - nitrite -nitrate - fluoride - sulphide - phosphate - phenols - surfactants - BOD - COD - DO - TOC	C&T, PPT
12	I-week Oct/2017	nondispersive IR spectroscopy - anode stripping - ICP - AES - Chromatography - ion selective electrodes - neutron activation analysis.	C&T, PPT
13	II-week Oct/2017	<b>Unit V-Soil pollution:</b> Soil humus - soil fertility - inorganic and organic in soil	C&T, PPT
14	III-week Oct/2017	acid - base and ion exchange reactions in soils - micro and macro nutrients - wastes and pollutants in soil	C&T, PPT
15	IV-week Oct/2017	Introduction to geochemistry - solid waste management - treatment and recycling- soil analysis - radioactive pollution - disposal of radioactive waste.	C&T, PPT
<b>COURSE ASSESSMENT METHODS</b>			
SI No.	Week/Date	Mode of assessment	Duration % Weightage



	II-week Aug/2017	Assignment/ Quiz / Group Discussion I	1 week	5
2	I-week Sep/2017	Test I (Unit 1 and II)	60 Minutes	20
3	IV-week Sep/2017	Assignment/ Quiz / Group Discussion II	1 week	5
4	III-week Oct/2017	Test II (Unit III and Unit IV)	60 Minutes	20
5	IV week Nov/2017	End semester	3 hrs	50
<b>TOTAL</b>				<b>100</b>

#### ESSENTIAL READINGS

1. H. Kaur, Environmental Chemistry, 6th Edn, Pragathi Prakashan, Meerut, 2011.
2. K.H.Mancy and W.,J.Weber Jr. Wiley, Analysis of Industrial Waste Water, Interscience New York, 1971.
3. L.W. Moore and E. A. Moore, Environmental Chemistry, McGraw Hill Publication, New York, 2002.
4. S. M. Khopkar, Environmental Pollution Analysis, New Age International (P) Ltd, 1993.
5. Colid Baird. Environmental Chemistry, W. H. Freemand and Company, 1995.
6. A. K. De, Environmental Chemistry, 5th Edn, New Age International (P) Ltd, 2005.

#### COURSE EXIT SURVEY

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 classes.
2. Compensation test for those who missed Test I or II will be conducted in III week of November covering the entire syllabus.
3. Plagiarism is strictly not allowed in assignments
4. 75% attendance is compulsory for writing the end semester exam. Compensation classes will be held for making up for attendance shortage in I and II week of November to be eligible to attend 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 \_\_\_\_\_

*U.R. Acharya*  
10/7/17

*Dr. A. Sreelank*

*Dr. L. CINDRELLA*  
10/7/17