

DEPARTMENT OF CHEMISTRY				CLASS: II UG				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/week	CIA	Ext	Total
III	NME	20U3CNM1	Applied Chemistry	2	2	25	75	100

Nature of Course			
Knowledge and skill			Employability oriented
Skill oriented	✓		Entrepreneurship oriented

Objectives: *The objective of this course is to make the student*

- (i) *To learn environmental management and planning*
- (ii) *To study about the hardness of water and their removal*
- (iii) *To know role of fertilizer in plant growth*
- (iv) *To learn how to make soap, detergents and insecticides*
- (v) *To understand fuels and classification*

Unit	Description	Hours	K-Level	CLO
I	ENVIRONMENTAL POLLUTION Definition – Causes, effect and control measures of air pollution (Greenhouse effect, Global warming, acid rain) - water pollution – Causes, effect and control measure.	6	K2	CLO-1
II	WASTE TREATMENT/MANAGEMENT Classification – Solid waste disposal, Solid waste management – Waste water treatment (domestic process – aerobic process – industrial process – Electrolysis process)	6	K2	CLO-2
III	AGRICULTURE Definition: Nutrition for plants - role of various elements in plant growth- natural and chemical fertilizer- preparation and uses of urea, NPK, super phosphate of lime and potash	6	K2	CLO-3
IV	SOAPS, DETERGENTS & INSECTICIDES Soaps and detergents: Preparation and types –cleansing action of soap. Insecticides: Definition, classification according to their action- preparation and uses of DDT, BHC and Bordeaux mixture.	6	K2	CLO-4
V	FUELS Introduction – classification of fuels – characteristics of good fuel – calorific value of a fuel – Gaseous fuels - advantages of gaseous fuel – composition of coal gas, LPG, Bio gas and gobar gas.	6	K2	CLO-5

Books for Study:

1. Environmental Chemistry seventh edition A.K. De, New age international publishers, 2007.
2. Industrial Chemistry, B.K. Sharma, GOEL Publishing House, Meerut, 1997.

Books For reference:

1. Engineering Chemistry 15th Edition, Jain, Jain - Dhanpath Rai publishing company (PVL), New Delhi.
2. Fundamental concepts of Applied Chemistry, J. Ghosh, S. Chand Limited, Nagpur, 2006.
3. Advanced Organic Chemistry, Bhal, B.S. and Arun Bahl, 2004, S. Chand and Co. Ltd, New Delhi.

Web Resources:

1. <https://en.wikipedia.org/wiki/Pollution>
2. https://www.geo.lu.lv/fileadmin/user_upload/lu_portal/projekti/gzzf/zinas/8.LECTURE-Environmental_pollution.pdf
3. https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/103107081/lec11.pdf
4. http://eacharya.inflibnet.ac.in/data-server/eacharya-documents/55daa452e41301c73a2cb5ac_INFIEP_208/798/ET/lec%20-%205.pdf
5. <https://www.svce.ac.in/departments/chemistry/CITM/CY%206251/Engg.%20Chem.%20%20%20%20II%20word/Unit%20V%20-%20Fuels%20&%20Combustion.pdf>

Rationale for Nature of the course

This course offers students a theoretical understanding of experiential learning programs and illustrative how experiential learning programs are used in day today life environmental pollution, waste water treatment process different types of fertilizers used for plant growth, preparation and various types of soaps, detergents and insecticides, introduction, classification and characterization of fuels.

Activities having direct bearing on Skill development / Employability / Entrepreneurship

The basic study of diary chemistry helps the students to understand create awareness causes and control of water and air pollution. They should know about the importance of waste treatment and water purification. The students can easily understanding need of fertilizers for the growth of plants. And also, they should learning cleaning action of soap and detergent and action of insecticides. Finally the students can able to study the calorific value of fuels and composition of gases fuels

Pedagogy

- Chalk-Talk class room activities
- Group Discussion
- Seminar/Assignment
- Quiz through ICT- Mode

Lesson Plan

Unit	Descriptions	Hours	Lecture Mode
I	ENVIRONMENTAL POLLUTION		
	Definition – Causes, effect and control measures of air pollution.	2	Chalk and talk, Group discussion/ Animated Videos
	Greenhouse effect, Global warming, acid rain	2	
	Water pollution – Causes, effect and control measure.	2	
II	WASTE TREATMENT/MANAGEMENT		
	Waste classification – Solid waste disposal, Solid waste management	2	PPT, Chalk and talk, Group discussion/ Animated Videos/BB
	Waste water treatment –domestic process	2	
	Waste water treatment –aerobic process–industrial process–Electrolysis process	2	
III	AGRICULTURE		
	Definition: Nutrition for plants - role of various elements in plant growth	2	PPT, Chalk and talk, Group discussion/ Animated Videos/BB
	Natural and chemical fertilizer	2	
	Preparation and uses of fertilizer -urea, NPK, super phosphate of lime, potash	2	
IV	SOAP, DETERGENTS&INSECTICIDES		
	Preparation of soap– Type of soap	1	PPT, Chalk and talk, Group discussion/ Animated Videos/BB
	Detergents – classification of detergents (cationic anionic) - cleansing action of soap.	2	
	Definition, classification according to their action preparation and uses of DDT	2	
	Preparation and uses of BHC, Bordeaux mixture	1	
V	FUELS		
	Introduction – classification of fuels – characteristics of coal fuel	2	PPT, Chalk and talk, Group discussion/ Animated Videos/BB
	Calorific value of a fuel - Gaseous fuels - advantages of gaseous fuel	2	
	Composition of coal gas, LPG, Bio-gas and gobar gas.	2	
Total Hours		30	

BB-Block board/Chalk and Talk, PPT-Power point presentation

Course Learning outcome: After successful completion of this course, the student will be able

On the successful completion of the course, students will be able to

CLOs	CLO Statement	Knowledge level
CLO1	Create awareness causes and control of water and air pollution	Up to K2
CLO2	Know the importance of waste treatment and water purification	Up to K2
CLO3	Understanding need of fertilizers for the growth of plants	Up to K2
CLO4	Understand the cleaning action of soap and detergent and action of insecticides	Up to K2
CLO5	Know the calorific value of fuels and composition of gases fuels	Up to K2

PO and CLO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5
CLO1	3	2	3	1	3
CLO2	3	3	3	-	-
CLO3	3	-	3	1	3
CLO4	3	-	3	-	-
CLO5	3	-	3	-	1

3-Strongcorrelation

2-Mediumcorrelation

1-WeakCorrelation

PLO and CLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO1	3	3	1	-	-	3	-
CLO2	1	2	1	-	-	3	-
CLO3	1	2	1	-	-	3	-
CLO4	1	2	1	-	-	3	-
CLO5	1	2	1	-	-	3	-

3-Advance application;

2-Intermediate level;

1-Basic level

Learning Outcome Based Education (LOBE) & Assessment

Formative Examination - I & II -Blue Print

Articulation Mapping - K Levels with Course Outcomes (CLOs)

S. No.	CLOs	K- Level	Section A		Section B (Either/or Choice)	Section C (Open Choice)
			Short Answers			
			No. of Questions	K- Level		
1	CLO x	Up to K 2	2	K1, K1	2 (K2 &K2)	1(K1)
2	CLO y	Up to K 2	3	K1, K1,K1	2 (K2 &K2)	2(K1, K1)
No. of Questions to be asked			5		4	3
No. of Questions to be answered			5		2	2
Marks for each question			2		5	10
Total Marks for each section			10		10	20

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers.

Learning Outcome Based Education (LOBE) & Assessment

Summative Examination – Blue Print

Articulation Mapping-K Levels with Courses Learning Outcomes (CLOs)

Units	CLOs	K- Level	Section A		Section B		Section C (open Choice)
			Short answers		(Either/or Choice)		
			No. of Questions	K- Level	No. of Questions	K- Level	
1	CLO 1	Up to K 2	1	K1	2	(K2&K2)	1(K1)
2	CLO 2	Up to K 2	1	K1	2	(K2&K2)	1(K1)
3	CLO 3	Up to K 2	1	K1	2	(K2&K2)	1(K1)
4	CLO 4	Up to K 2	1	K1	2	(K2&K2)	1(K1)
5	CLO 5	Up to K 2	1	K1	2	(K2&K2)	1(K1)
No. of Questions to be asked			5		10		5
No. of Questions to be answered			5		5		3
Marks for each question			2		7		10
Total Marks for each section			10		35		30

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers.

Distribution of Section-wise marks with K-levels

K Levels	Section A (No Choice)	Section B (Either / or)	Section C (Open Choice)	Total Marks	% of Marks without choice	Consolidated
K1	10		50	60	46	46
K2	-	70		70	54	54
Total marks	10	70	50	130	100	100

Name of the course Designer

- Dr. R. Ramachandran