

DEPARTMENT OF CHEMISTRY				CLASS: I PG				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/week	CIA	Ext	Total
I	Non-Major Elective	21P1CNM1	Applied Chemistry	2	2	25	75	100

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

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

(i) *To study about the usage of safety matches and its preparation, calculation of oxidation numbers.*

(ii) *To know about corrosion, rusting of iron, and manufacturing of paints.*

(iii) *To study the preparation and importance of Antipyretics, Analgesics and Antiseptics.*

(iv) *To study about different types of polymers like PVC, Nylon and polyethylene.*

(v) *To know about the hardness of water disadvantages and removal of hardness using various methods.*

Unit	Description	Hours	K-level	CLO
I	<b>Small Scale Units</b> Preparation and importance of safety matches – Agarbattis - Naphthalene balls - Shoe polish – Chalk piece – tooth paste – phenoyl – ink- camphor tablets.	6	Up to K2	CLO-1
II	<b>Corrosion</b> Corrosion – definition – Types of corrosion- rusting of iron – preventive methods: Cathodic and Anodic protection-corrosion inhibitors-Electro plating method – Paints – varnishes.	6	Up to K2	CLO-2
III	<b>Pharmaceutical Chemistry</b> Classification of drugs - Application of the following drugs: Antipyretics: Salicin, Phenacetin, Aspirin, Tylenol. Analgesics: Novalgin, Chloroform, Diethyl ether. Antiseptics: Chloramine-T, Dettol, Thymol, Boric acid, Potassium permanganate. (structure and synthesis not necessary) Chemotherapy: definition – classification of chemotherapeutic agents (names and uses only).	6	Up to K2	CLO-3
IV	<b>Polymers</b> Monomer – polymer – definition – classification – differences between thermoplastics and thermosetting polymers – Polymerization: definition, types and examples – examples for addition, condensation and co-ordination polymers – Properties and uses of following: Polyethylene, Polyvinyl chloride (PVC), Polytetrafluoroethylene (PTFE), and Nylon-66	6	Up to K2	CLO-4
V	<b>Water Treatment</b> Water: Source of water – characteristics of water – Hardness of water – Types – Temporary hardness – permanent hardness – disadvantages of hard water – Removal of hardness – Reverse osmosis – zeolite process.	6	Up to K2	CLO-5

**Books for study:**

1. Ghosh, J. Fundamental concepts of Applied Chemistry, 1<sup>st</sup> Edition, S. Chand Limited, Nagpur, 2006.
2. Jain, P. C., Jain, M. Engineering chemistry, 15<sup>th</sup> edition., 1998, Dhanpat Rai Publishing Company.
3. Kapur, K. Text Book of Applied Chemistry, 1<sup>st</sup> edition, New Delhi, H.Tata publications, 1994.

**Books for Reference:**

1. Sharma, B. K., Industrial chemistry, 11<sup>th</sup> Edition Goel Puplicsihing House, 1994.
2. Charrabarthi B.N., Industrial Chemistry, 1<sup>st</sup> Edition, Oxford and IBH Publishing co. Pvt. Ltd. 1981.
3. A, L. Gupta, Polymer Chemistry, PragatiPrakshan Publications, Meerut, Revised edition, 2010.
4. Jayashree Gosh, A textbook of Pharmaceutical Chemistry, S. Chand Publications, 1<sup>st</sup> edition, 2017

**Web resources**

1. <https://www.entrepreneurindia.co/book-details/294/surfactants-disinfectants-cleaners-toiletries-personal-care-products-manufacturing-and-formulations>
2. <https://www.twi-global.com/technical-knowledge/faqs/what-is-corrosion>
3. <https://accessmedicine.mhmedical.com/content.aspx?sectionid=102161048&bookid=1613>
4. <https://www.sciencenewsforstudents.org/article/explainer-what-are-polymers>
5. <https://www.hunterwater.com.au>

**Rationale for Nature of the course**

This course will enable the students to enrich the understanding of preparation of various compounds like Agarbattis, Naphthalene balls, Shoe polish etc., fundamental principles of corrosion and mechanism of rust formation, Antipyretics and analgesics, Antiseptics, polymers and its types. Students know about the hardness of water and how the hardness will be removed.

**Activities having direct bearing on Skill development/Employability/Entrepreneurship**

The basic study of preparation of various compounds like Agarbattis, Naphthalene balls, Shoe polish etc., the concepts of corrosion and its mechanism were explained by doing chart work. The Removal of hardness, Reverse osmosis, zeolite process was explained by industrial visit.

**Pedagogy**

- Chalk-Talk Class room Activities
- group Discussion
- seminar
- Quiz through ICT- Mode

## Lesson Plan

Unit	Descriptions	Hours	Lecture Mode
	<b>Small Scale Units</b>		
<b>I</b>	Introduction and manufacturing of Safety matches – Agarbattis.	2	BB/PPT
	Manufacturing of Naphthalene balls - Shoe polish – Chalk piece.	2	BB/PPT/
	Preparation and importance of tooth paste – phenoyl – ink- camphor tablets.	2	BB/PPT
<b>II</b>	<b>Corrosion</b>		
	Corrosion – definition - Types of corrosion- rusting of iron.	2	BB/PPT
	Preventive methods: Cathodic and Anodic protection-corrosion inhibitors.	2	BB/PPT
	Electro plating method – Paints – varnishes.	2	BB/PPT
<b>III</b>	<b>Pharmaceutical Chemistry</b>		
	Classification of drugs- Application of the following drugs: Antipyretics: Salicin, Phenacetin, Aspirin, Tylenol.	2	BB/PPT
	Analgesics: Novalgin, Chloroform, Diethyl ether. Antiseptics: Chloramine-T, Dettol, Thymol.	2	BB
	Boric acid, Potassium permanganate.(structure and synthesis not necessary) Chemotherapy:definition – classification ofchemotherapeutic agents(names and uses only).	2	BB/PPT
<b>IV</b>	<b>Polymers</b>		
	Monomer – polymer – definition – classification – differences between thermoplastics and thermosetting polymers	2	BB/PPT
	Polymerization: definition, types and examples – examples for addition, condensation and co-ordination polymers	2	BB/PPT
	Properties and uses of following: Polyethylene, Polyvinyl chloride (PVC), Polytetrafluoroethylene (PTFE), and Nylon-66	2	BB
<b>V</b>	<b>Water Treatment</b>		
	Water: Source of water – characteristics of water – Hardness of water	2	BB/PPT
	Types – Temporary hardness – permanent hardness – disadvantages of hard water	2	BB/PPT
	Removal of hardness – Reverse osmosis – zeolite process	2	BB/PPT
	<b>Total Hours</b>	30	

**Course outcome: After complete successful of this course, the student will be able to**

CLOs	CLO statement	Knowledge level
<b>CLO1</b>	Elaborate the preparation and importance of household products.	Up to K2
<b>CLO2</b>	Explain the corrosion and its preventive methods.	Up to K2
<b>CLO3</b>	Outline the importance of Antipyretics, Analgesics and Antiseptics.	Up to K2
<b>CLO4</b>	Illustrate the different types of polymers and polymerisation.	Up to K2
<b>CLO5</b>	Know about the hardness of water and its types, various removable methods.	Up to K2

### PLO and CLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
<b>CLO1</b>	1	1	1	2	2
<b>CLO2</b>	1	2	1	3	2
<b>CLO3</b>	2	3	2	3	2
<b>CLO4</b>	1	2	1	1	1
<b>CLO5</b>	1	3	1	1	2

3-Advance application;

2-Intermediate level;

1-Basic level

Components of Formative Assessment	Marks	K level
Internal Test	<b>10</b>	As per below table
Assignment	<b>5</b>	K2
Quiz	<b>5</b>	K2
Seminar	<b>5</b>	K2
<b>Total</b>	<b>25</b>	

### 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	1	2 (K2&K2)	K1
2	CLO 2	Up to K 2	1	K1	1	2 (K2&K2)	K1
3	CLO 3	Up to K 2	1	K1	1	2 (K2&K2)	K1
4	CLO 4	Up to K 2	1	K1	1	2 (K2&K2)	K1
5	CLO 5	Up to K 2	1	K1	1	2 (K2&K2)	K1
No. of Questions to be asked			5		5		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. Sathya