SARVAJANIK UNIVERSITY

SARVAJANIK COLLEGE OF ENGINEERING AND TECHNOLOGY

BACHELOR OF TECHNOLOGY

B.Tech	I	Semester	I/II	Teaching Scheme				Evaluation Scheme	
Subject Name	Engineering Chemistry			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTAS21101			2	0	-	2	50	50
Type of course	BSC: Basic Science Course			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	Fundamentals of Organic / Inorganic / Physical / Analytical Chemistry								
Rationale	Material/Substance studies is the heart of understanding the Applied Chemistry which further helps in preparing ground to understand engineering better.								

Course Outcomes (COs): At the end of the course, students will be able to		**Marks % weightage**
CO – 1	Identify the quality of water and relate the different techniques of water treatment.	20
CO – 2	Determine the complexity of engineering problems and utilize correct metals and polymers	20
CO – 3	Describe the importance and application of engineering materials	40
CO – 4	Interpret the methods of functional chemistry as a logical means of problem solving	10
CO – 5	Distinguish the ranges of the electromagnetic spectrum used and apply it for exciting different molecular energy levels in various spectroscopic techniques and use it further to derive the logical issues	10

COURSE CONTENT

Unit	Content	Tentative Teaching Hours	Tentative Unit Weight %
1.	**Unit 1: Water Chemistry** Introduction, Sources of water, Impurities in water, Water as a green Solvent, Hardness of Water, Boiler Problems-Scale and Sludge Formation and Boiler Corrosion, Softening of water (External & Internal treatments), Domestic water treatments, Desalination of Brackish water, Reuse of Brine.	6	20%

2.	**Unit 2: Metals, Alloys and Corrosion** Properties of Metals, Definition and purpose of alloys, Classification of alloys, Industrial applications of Steel, Cu, Al and Mg alloys Introduction to Corrosion, Theories of corrosion, Types of Corrosion: Pitting, Galvanic and Stress, Preventive measurements against corrosion like – Anodic & Cathodic protection, Use of Inhibitors etc.	6	20%
3.	**Unit 3: Polymers and Fibers** Introduction, Classification based on structure and molecular forces, Polymerization methods and its mechanism, Biodegradable Polymers, Commercially important polymers- PE, PP, Polycarbonates, Polyurethanes and their uses, Different types of fibers, Physical properties and uses of fibers.	6	20%
4.	**Unit 4: Important Engineering Materials:** **(a) Portland Cement:** Manufacture and Testing, Setting and Hardening Property. **(b) Fuels:** Classification, Alternative Fuels, Hydrogen Fuel and Bio fuels and their importance. **(c) Nano Materials:** Synthesis methods and Applications. **(d) Cells:** Different types of cells and their working: Electrochemical and Electrolytic Cell, Fuel Cell. **(e) Ceramic & Refractories Materials:** Classification, preparation and uses. **(f) Lubricants:** Classification, Substance use as a lubricant, Selection of Lubricants.	9	30%
5.	**Unit 5: Analytical Techniques** Measurement and understanding of pH, Conductance, Introduction of Spectroscopic techniques, Principles of Spectroscopy and Selection rules, UV-Visible Spectroscopy and its Applications.	3	10%

Suggested Specification table with Marks:

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	40	40	10	0	0

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Recommended Reference Books

1. Engineering Chemistry by P. C. Jain and Monika Jain, Dhanpat Rai Publications(P)Ltd.,17th Edition,2020
2. Engineering Chemistry by Jaya Shree Anireddy, Wiley India Pvt. Ltd.,1st Edition,2019
3. A Textbook of Engineering Chemistry by S.S.Dara & S.S.Umare, S.Chand Publishing, 12th Edition, 1986
4. Engineering Chemistry by N. Krishnamurthy, P. Vallinaygam and D. Madhavan, Prentice Hall of India Pvt. Ltd., 4th Edition, 2019
5. Engineering Chemistry by K. Sesha Maheswaramma and Mridula Chugh, Pearson India Education Pvt.

Ltd., 1st Edition, 2016

6. Engineering Chemistry by B K. Sharma, Krishna Prakashan Media (P) Ltd., 7th Edition, 2020
7. Engineering Chemistry Fundamental and Application by Shikha Agrawal, Cambridge University Press, 2nd Edition, 2019
8. Introduction to Nano Science by S M. Lindsay, Oxford University Press, 1st Edition, 2009
9. Nano Materials by A. K Bandyopadhyay, New Age International Publishers, 1st Edition, 2009
10. Industrial Chemistry by B.K.Sharma, Goel Publishing House, Merut, 14th Edition, 2004
11. Textbook of Engineering Chemistry by Sharma Y.R., Mitra P., Kalyani Publishers, 7th Edition,2018 Rept. 2023

CO-PO-Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO – 1	3	1	1	1	-	2	2	-	-	-	-	1
CO – 2	3	3	1	-	-	1	2	-	-	-	-	1
CO – 3	3	2	3	-	1	1	2	-	-	-	-	1
CO – 4	3	2	2	1	2	1	1	1	-	-	-	1
CO – 5	3	2	1	3	2	1	1	1	-	-	-	1

List of Open Source/learning website/Other Details if any:

- https://vlab.amrita.edu/?sub=2
- https:// https://nptel.ac.in/courses/104/101/104101090/
- https://nptel.ac.in/courses/105/104/105104102/
- https://nptel.ac.in/courses/113/104/113104082/
- https://nptel.ac.in/courses/104/105/104105124/
- https://nptel.ac.in/courses/104/106/104106122/
- https://nptel.ac.in/courses/112/104/112104203/
- https://vlab.amrita.edu/?sub=2