

SARDAR PATEL UNIVERSITY
Bachelor of Science (Program)

Industrial Chemistry Vocational
(Effective from Academic Year 2021-22)

Program Specific Outcomes

- To understand Chemistry and its application at industrial level through theory and practical exposure.
- To explain an application of chemistry & chemical engineering for production at industrial scale. Also, to explain nomenclature, stereochemistry, structures, reactivity and mechanism of the chemical reactions.
- To develop knowhow of various concepts of chemical engineering as well as various applicability of chemistry in varied industries like polymers, petroleum, fine chemicals, pharmaceuticals etc.
- To study of various chemical reactions and analytical procedures by performing them in laboratory.
- To develop a texture of chemical industries, a six week in-plant training, industrial visit, project and in class presentations are the part of curriculum. Exposure to various routine as well as specialized instruments utilized at industrial and research level.
- To increase the understanding towards chemical hazards, safety and laboratory practices.
- To develop skill to be an entrepreneur.





SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

(Bachelor of Science) (Industrial Chemistry Vocational)
(B.Sc.) (UG) Semester (I)

Course Code	US01CICV51	Title of the Course	Industrial Aspects Of Chemistry
Total Credits of the Course	04 (Four)	Hours per Week	04 (Four)

Course Objectives:	This paper will help students to understand about various types of chemical industries, their products and processes which rely on core concepts and application of chemistry and chemical engineering. Students will understand and learn various chemical products that hold importance in day to day life and obtained by process chemistry.
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Course Content		
Unit	Description	Weightage* (%)
1.	Petroleum, natural gas, Fractionation of crude oil, Cracking, Reforming, Hydro-forming, Isomerisation petrochemicals. Coal – Structure and properties, Analysis of coal, Carbonization process, Manufacture of coke and coal gas, Distillation of coal tar, Chemicals derived there from.	25%
2.	Renewable natural resources, cellulose and starch – their properties and uses, Important chemicals derived from cellulose and starch, Alcohol and alcohol-based chemicals. Inorganic materials of Industrial aspects – Importance, their availability, forms, structure and modification, Alumina, Silica, Silicates, Clay, Mica, Carbon and Zeolites.	25%
3.	Basic metallurgical operations-Calcinations, Roasting, Sintering, Refining, Furnace Secondary metals, Alloys Physiochemical principles in extraction of Iron, Copper, Aluminium, Nickel, Magnesium, Lead and Silver. Heat treatment operations.	25%
4.	Engineering materials, their need and classification, Selection of material of construction, Metals and alloys-Important metals and alloys, Iron, copper, aluminium, Lead, Nickel, Titanium and their alloys. Cement-Its composition and types, manufacturing process, setting of cement. Ceramics-Introduction, types, manufacturing process, applications. Refractories, Glass-types, composition, manufacture, properties and applications.	25%



Teaching-Learning Methodology	Class room teaching using ICT facilities with audio and video presentation black board teaching method including industrial visit to observe the applicability of subject the subject. Student's seminars and presentation. Assignments per units.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Students will learn about raw materials for organic compounds – Petroleum and its products including natural recourses of energy.
2.	Learn about “Renewable natural resources and Inorganic materials of Industrial aspects.
3.	Introduction to Basic metallurgical operations, Physiochemical principles in extraction of various metals.
4.	Student will learn about Engineering materials and its classification. Introduction to Cement & Glass industries.

Suggested References:	
Sr. No.	References
1.	Extractive metallurgy, Joseph & Newton.
2.	A textbook of material science & metallurgy, O.P.Khanna.
3.	Chemistry of Engineering Materials. C.V.Agarawal.
4.	Introduction to Petroleum Chemicals, H.Steiner, Cotton – Cellulose: Its chemistry & technology, Hall A.G.
5.	Chemistry in engineering and technology, Volume I & II, J.C. Kuricose & J. Rajaram. (Tata McGraw Hill).



6.	A Textbook of chemical technology, Volume I & II, G.N. Pandey. (Vikas Publishing House).
7.	Engineering Chemistry, Jain & Jain., 17. Chemistry of Engineering materials, C.V. Agarwal.
8	Shreve's Chemical Process Industries, George A. Austin (McGraw Hill Co).
9	Materials for engineering, Edition 3, John Martin, Woodhad Publishing in materials

On-line resources to be used if available as reference material

On-line Resources: Google books, INFLIBNET, PDF Drive, Swayam, NPTEL.

