

KASHI NARESH UNIVERSITY, BHADOHI

(National Education Policy-2020)

**Syllabus
of
Chemistry
(Effective from Academic Session 2026-2027)
For
B.Sc.**

Approved by
Board of Studies
Department of Chemistry,
Faculty of Science
Kashi Naresh University, Bhadohi

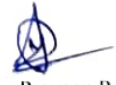

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Programme/ Class: B.Sc	Year: First	Semester: II
Subject: Chemistry(Minor elective)		
Course Code: B20203TM	Course Title: Inorganic Materials of Industrial Importance	
Objectives: This course will help students for use of inorganic materials like Glass, Battery, catalyst, Alloy & its benefits. It would fulfil the gap between academia and industries.		
Learning Outcomes: By the end of the course, the students will be able to: - Understand the use of Inorganic materials in daily life - Learn and use various Materials used in industries - Develop scientific solutions for societal needs		
Credits: 6		Minor Elective
Max. Marks: 75+25		Min. Passing Marks: As per rules
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 6-0-0 .		
Unit	Topics	No. of Lectures
I	Silicate Industry Glass: Glassy state & its properties, classification, manufacturing& processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armored glass, safety glass, borosilicate glass, fluorosilicate, colored glass, photosensitive glass. Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibers. Cements: Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.	30
II	Fertilizers: Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.	15
III	Batteries: Primary and secondary batteries, battery components and their role. Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.	10
IV	Alloys: Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization,	15

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	demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.	
V	Catalysis: General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts. Phase transfer catalysts, application of zeolites as catalysts.	10
VI	Chemical explosives: Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.	10

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R. M. Felder, R. W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- W. D. Kingery, H. K. Bowen, D. R. Uhlmann: Introduction to Ceramics, Wiley Publishers, New Delhi.
- J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- P. C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
- R. Gopalan, D. Venkappayya, S. Nagarajan: Engineering Chemistry, Vikas Publications, New Delhi.
- B. K. Sharma: Engineering Chemistry, Goel Publishing House, Meerut

Teaching Learning Process:

- Lectures using teaching aid (chalk/power point/videos)
- Group discussion
- Presentations
- Advise to students to prepare a report on technological applications
- Visit to nearby industries
- Invite people of industries for interaction with students

Assessment Methods:

- Graded assignments
- Conventional class tests
- Class seminars by students on course topics with a view to strengthening the content through
 - width and depth
- Quizzes
- End semester university examination.

Keywords:

Glass, Ceramics, Cement, Alloy, Batteries, Fertilizers, Catalysis, Explosive

This course can be opted as an minor elective by the students of following subjects: Open for all

Suggested Continuous Evaluation Methods:

Continuous Internal Evaluation shall be based on allotted assignment and Class Test. The marks shall be as follows

Internal Assessment	Marks
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Programme/Class: B.Sc.		Year: II	Semester: IV
Subject: Chemistry (Minor elective)			
Course Code: B20404TM		Course Title: Basics of Industrial Chemistry	
Objectives: - This course has been exclusively designed for the sophomores to achieve motive of chemistry used for industry civilization. - Students shall achieve a basic as well as edge cutting knowledge of the industrial chemistry.			
Learning Outcomes: By the end of the course, the students will be able to: - Understand the use of basic chemistry to industrial chemistry. - Learning and use of various chemical technologies used in industries. - Developed scientific solutions for societal needs.			
Credits: 6			Minor Elective
Max. Marks: 75+25			Min. Passing Marks: As per rules
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 6-0-0.			
Unit	Topics		No. of Lectures(90)
I	i. Brief history and developments of the industrial Chemistry. ii. Industrial Gases: N ₂ , O ₂ , H ₂ , CO ₂ - manufacture, uses and economics. Petroleum Refining Process: Introduction, distillation, octane number, additives, hydro-treating, cracking, reforming, alkylation and polymerization, separation of natural gas (methane production).		20
II	Pesticides: Introduction to pesticides, manufacture and use of some insecticides such as DDT, organophosphorus insecticides; herbicides- such as heterocyclic nitrogen based organic compounds. Fertilizers: History and economics of fertilizers, Fertilizer materials, direct application fertilizers, mixed fertilizers (nitrogen, phosphorus and potassium sources, ammoniation) liquid vs solids, and controlled release fertilizers.		15
III	Cosmetics and Perfumes: Definition and characteristics, creams, Hairsprays, Hairdyes, Toothpowder and tooth paste, talcum powder, face powder, lipsticks, nail polish, shampoos sun-tan lotions; perfumes and essential oils.		15

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IV	Cane Sugar Industry: Manufacture of white crystalline sugar, extraction of the juice, clarification (lime defaction process, by sulphate ion and by carbonation), evaporation, crystallization and refining of sugar, uses of bagasse.	15
V	Surfactants, Soaps and Detergents: Introduction, cationic and anionic surfactants, straight chain detergent intermediates linear alcohol sulphates (AS), linear alcohol ethoxy sulphates (AES) and linear alkyl benzene sulfonates (LAS), Amphoteric and detergent builders.	15
VI	Pulp and Paper Industry: Manufacture of pulp and paper and their uses.	10

References:

1. Dr. Ram Prasad: Petroleum refining technology.
2. M. B. Green, G. S. Hartley West: Chemicals for Crop Protection and Pest Management, Pergamon.
3. Kent-Riegels: Industries Chemistry.
4. R.W. Thomas and P. Farago: Industrial Chemistry (HEB).
5. K. Bhogavathi Somdavi: Applied Chemistry, MJP Publications, 2006.
6. C.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut, 2011

Keywords:

Chemical reactions, Natural and Synthetic materials, Industrial chemistry, Analytical Chemistry

This course can be opted as an minor elective by the students of following subjects: Open for all

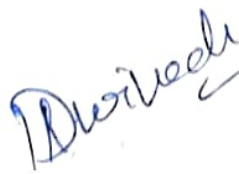
Suggested Continuous Evaluation Methods:

Continuous internal evaluation shall be based on allotted assignment and Class Test. The marks shall be as follows

Internal Assessment	Marks
Quizzes	10
Viva	10
Records	05
Course prerequisites: To study this course, a student must have 10+2.	



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