

Maa Vindhyavasini University Mirzapur

Minor Elective Paper

Subject - Chemistry

Objective:

This course will help students to connect chemical technology for societal benefits. It would fulfil the gap between academia and industry.

Semister	Course Code	CourseTitle	Credit	Marks
II	B020203M	Chemical technology And society	6	100 (75+25)
IV	B020204M /	Inorganic Meterials Of Industrial Importance	6	100 (75+25)

Note:

The above Syllubas is required for those Students who do not Adopted chemistry as Major subject.



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Maa Vindhyavasini University, Mirzapur

Subject: Chemistry		
Programme/Class: B.Sc	Year: First	Semester: II ✓
Course Code: B 020203 M	Course Title: Chemical Technology and Society	
Objectives: - This course will help students to connect chemical technology for societal 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 basic chemistry to chemical engineering - Learn and use various chemical technology used in industries - Develop scientific solutions for societal needs		
Credits: 06		Minor Elective
Max. Marks: 75+25		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-0.		
Unit	Topics	No. of Lectures
I	Chemical Technology Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology	15
II	Society Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants).	15
III	Sources of energy Coal, petrol and natural gas. Nuclear fusion /	20



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	fission, solar, hydrogen, geothermal, tidal and hydel. Properties of Polymers (Physical, thermal, Flow & Mechanical Properties) Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) and related polymers, poly(vinyl acetate) and related polymers, acrylic polymers, fluoro polymers, polyamides and related polymers. Phenol formaldehyde resins (Bakelite, Novolac), polyurethanes, silicone polymers, polydienes, Polycarbonates, Conducting Polymers, [polyacetylene, polyaniline, poly(p-phenylene sulphide), polypyrrole, polythiophene].	
IV	Natural Polymers Structure, properties and applications of shellac, lignin, starch, nucleic acids and proteins. Basics of drug synthesis Application of genetic engineering	10

References:

1. Hill, J.W.; McCreary, T.W.; Kolb, D.K. (2013), Chemistry for changing times, Pearson.

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.


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Keywords:	
Chemical Technology; Society; Energy; Polymer; Pollutants	
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
Class Interaction	05
Quiz	10
Seminar	10
Course prerequisites: To study this course, a student must have 10+2	




Programme/Class: B.Sc		Year: First - II	Semester: IV
Subject: Chemistry			
Course Code: BCR404M		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:	
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-0.			
Unit	Topics		No. of Lectures
I	Silicate Industry A. 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. B. 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. C. Cements: Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.		16
II	Fertilizers: Different types of fertilizers. Manufacture of the following fertilizers: Urea,		10

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	ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.	
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.	08
IV	Alloys: Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.	10
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.	08
VI	Chemical explosives: Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.	08

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.
- 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:

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- Lectures using teaching aid (chalk/power point/videos)
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Keywords:

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

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