

Teaching Plan 2024-25

B.Sc. Physical science, V Semester,

Inorganic Materials of Industrial Importance: Dr YUKTI MONGA

Week	Dates From – To	Topic
1.	1/08/2024 - 3/08/2024	Introduction of the subject, UNIT 2-Fertilizers- introduction
2.	05/08/2024- 10/08/24	Different types of fertilizers, importance, chemistry involved in the manufacturing of Urea,
3.	12/08/2024 - 17/08/2024	Chemistry Involved in the manufacturing of Ammonium nitrate, Calcium Ammonium Nitrate, Ammonium Phosphate,
4.	19/08/2024 - 24/08/2024	Chemistry Involved in the manufacturing of Superphosphate of Lime, Potassium chloride, Potassium Nitrate, Environmental impact of Fertilizers
5.	26/08/2024 - 31/08/2024	Unit 1 Silicate Industries-Glass, glassy state, properties, classification, manufacturing and Processing of glass.
6.	02/09/2024 - 07/09/2024	Silicate industries-composition and properties of soda lime glass, lead glass, armored glass, borosilicate glass.
7.	09/09/2024- 14/09/2024	Different types of safety glass, fluorosilicate glass, coloured glass, photosensitive glass, photochromic glass, glass wool and optical fibre.
8.	16/09/2024 - 21/09/2024	Cement: Manufacture of Portland cement and setting process, different types of cement. Quick setting cement, Ecofriendly cement, Pozzolana cement.
9.	23/09/2024 - 28/09/2024	Ceramics: brief introduction, Glazing of ceramics
10.	30/09/2024 - 05/10/2024	Unit 3 Brief introduction and classification of surface coatings, paints and pigments: formulation, composition and related properties, PVC, CPVC.
11.	07/10/2024 - 12/10/2024	Fillers, thinners, enamels, emulsifying agents,
12.	14/10.2024- 19/10/2024	Plastic paints, water and oil paints, Preliminary methods for surface preparation,
13.	21/10/2024- 25/10/2024	special paints: heat retardants, fire retardants, eco-friendly paints.
14.	27/10/2024 - 3/11/2024	Mid- semester break

15.	04/11/2024 - 09/04/2024	Test for unit 1, 2 and 3, presentations for internal assessment,
16.	11/11/2024 - 16/11/2024	Metallic coating: electrolytic and electroless with reference to chrome plating and nickel plating, metal spraying and anodizing
17.	18/04/2024 - 23/04/2024	Contemporary surface coating methods like physical vapor deposition, CVD,
18.	25/11/2024 - 28/11/2024	Galvanising, Carburizing, Sherardising, Boriding, nitriding, cementation

Syllabus

<p>Course Code: DSE -3 CHEMISTRY</p> <p>Course Title: Inorganic Materials of Industrial Importance</p> <p>Total Credits: 04 (Credits: Theory-02, Practical-02)</p> <p>Total Lectures: Theory- 30, Practical-60</p>
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Objectives:

The course introduces learners to the importance of Inorganic compounds in Industries. It gives an insight into how the inorganic materials form a basis of the products used in day-to-day life like silicates, fertilizers, surface coatings. The course helps develop the interest of students in the frontier areas of inorganic and material chemistry.

Unit 1: Silicate Industries**Lectures:10**

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, different types of safety glass, borosilicate glass, fluorosilicate glass, coloured glass, photosensitive glass, photochromic glass, glass wool and optical fibre.

Ceramics: Brief introduction to types of ceramics. glazing of ceramics.

Cement: Manufacture of Portland cement and the setting process, Different types of cements: quick setting cements, eco-friendly cement (slag cement), pozzolana cement.

Unit 2: Fertilizers**Lectures:08**

Different types of fertilizers (N, P and K). Importance of fertilizers, chemistry involved in the manufacture of the following fertilizers: urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates, superphosphate of lime, potassium chloride and potassium nitrate. Environmental impact of fertilizers.

Unit 3: Surface Coatings**Lectures:12**

Brief introduction to and classification of surface coatings, paints and pigments: formulation, composition and related properties, pigment volume concentration (PVC) and critical pigment volume concentration (CPVC), fillers, thinners, enamels and emulsifying agents. Special paints: heat retardant, fire retardant, eco-friendly paints, plastic paints, water and oil paints. Preliminary methods for surface preparation, metallic coatings (electrolytic and electroless with reference to chrome plating and nickel plating), metal spraying and anodizing. Contemporary surface coating methods like physical vapor deposition, chemical vapor deposition, galvanising, carburizing, sherardising, boriding, nitriding and cementation.

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