

COURSE OBJECTIVES:

- To introduce concepts related to Chemical industries like cement, fertiliser and paper.

COURSE OUTCOMES:

Students after successful completion of the course will be able to:

1. Identify the importance of different surface coatings.
2. Acquire a critical knowledge on manufacture of ceramics and cement.
3. Understand various steps in the manufacture of cane sugar.
4. Explain the manufacture of pulp and paper.

SYLLABUS :(*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.*)

UNIT-1: FERTILIZERS

10 hours

A brief introduction to industrial chemistry, Different types of fertilizers. Manufacture of the following fertilizers: Urea, Ammonium nitrate, Calcium ammonium nitrate, Ammonium phosphates; Polyphosphate, Superphosphate, Compound and mixed fertilizers.

UNIT-2: SILICATES

10 hours

Ceramics: Important clays and Felds par. Ceramics-types, uses and manufacture. High technology ceramics and their applications.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

UNIT-3: SURFACE COATINGS

12 hours

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, modified oils, Pigments, toners and lake pigments, fillers, thinners, enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Water and Oil paints.

UNIT-4: SUGAR CHEMISTRY

08hours

Introduction–Manufacture and recovery of cane sugar from molasses, manufacture of sucrose from beat root, testing and estimation of sucrose.

UNIT-5: PAPER INDUSTRY

10hours

Pulp and Paper- Introduction, Manufacture of pulp, sulphate or Kraft pulp, soda pulp, sulphite pulp, rag pulp, beating, refining, filling, sizing and colouring of pulp, manufacture of paper.

REFERENCES:

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis HorwoodLtd.UK
2. J. A. Kent: *Riegel's Hand book of Industrial Chemistry*, CBS Publishers, New Delhi.
3. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
4. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.
5. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut

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