# COURSE WISE BREAKUP

## Fourth Year  Seventh Semester

**SPECILIZATION**  APPLIED CHEMISTRY

### THEORY

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<tr>
<td>CHEM-421</td>
<td>PAPER-I: APPLIED CHEMISTRY</td>
<td>03</td>
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### PRACTICALS

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- Total Credits of the Semester = 15 (theory 09 & practicles 06 credits)
- Maximum Marks = 450 (theory 300 & practicles 150 marks)
Sugar Industry
Scope of sugar industry; Manufacture of raw sugar from cane and beet; Refining of raw sugar; Methods of clarification of cane juice and chemistry involved in the clarification processes: Defecation Remelt Carbonation (DRC), Defecation Remelt Sulphitation (DRS), Defecation Remelt Phosphitation (DRP) and Double Carbonation Double Sulphitation (DCDS); Utilization of by-products of sugar industry.

Starch Industry
Scope of starch industry; Raw materials for starch production; Manufacture of starch from various raw materials such as corn, rice, wheat, potatoes; Industrial applications of starch; Chemistry involved in the conversion of starch; Synthesis of d-glucose and dextrin from starch.

Leather Industry
Leather, gelatine and adhesives; Preparation of hides; Methods of tanning, Vegetable and chrome tanning processing of leather; Production of glue and gelatine.

Fertilizers
Importance of chemical fertilizers; Classification of chemical fertilizers; Manufacture and chemistry involved in the production of various fertilizers i.e. Urea, Single Super phosphate (SSP), Triple super phosphate (TSP), Nitrophos (NP), Diammonium phosphate (DAP), Calcium ammonium nitrate (CAN), Ammonium nitrate (AN), Ammonium sulphate (AS), Zinc sulphate (ZS) and Complex fertilizers.
Agrochemical Industry
Classification of pesticides; Formulation and toxicity of pesticides; Future trends of pest control; Control of weeds; Household agrochemicals; Plant growth regulators and background chemistry; Hazards associated with the use of agrochemicals and environmental aspects.

Industrial Pollution and Environmental Protection
Sources of air, water and soil pollution; Industrial waste and its control for environmental protection; Modern trends for waste treatment; Industrial gases and pollution control methods; Role and production of free radicals and atmospheric chemistry.

4th Year; 7th Semester
PAPER-III
Title of the Course: APPLIED CHEMISTRY Code: CHEM-423
Credit Hours: 03 Marks: 100
Course Contents:
Oils, Fats, Waxes and Vegetable Ghee Industry
Oils, Fats and Waxes; Extraction of oils such as soybean and cotton seed oils; Purification and refining of oils; Chemistry involved in the production of vegetable ghee; Selective hydrogenation of oil and fats during the manufacture of vegetable ghee; Interesterification of crude fats.

Soaps and Detergents
Raw materials for the manufacture of soap and detergents; Chemistry involved in the production of soap and detergents; Action of builders, additives brightners and surfactants; Cleansing action of soaps; Effect of acidic species and hard water on soap; Production of transparent soap.

Surface Coating Industry
Raw materials for paints and pigments; Classification and properties of surface-coating constituents; Classification and manufacture of pigments; Production of paints, varnishes, distempers, enamals and lacquers; Chemistry involved in the drying phenmena of paints; Drying oils for paint and classification of drying oils.
4th Year; 7th Semester

PAPER-I
Title of the Practicals: APPLIED CHEMISTRY Code: CHEM-421
Credit Hours: 02 Marks: 50
Water analysis; Analysis of oil and fats; Testing and analysis of vegetable ghee; Synthesis of soap and its analysis; Analysis of bleaching powder; Fertilizer analysis and testing of raw materials such as phosphate rock and ores; Various other practicals may be added in accordance with the available facilities.

4th Year; 7th Semester

PAPER-II
Title of the Practicals: APPLIED CHEMISTRY Code: CHEM-422
Credit Hours: 02 Marks: 50
Analysis of coal and petroleum fuels; Cement analysis and testing of raw materials; Milk analysis; Analysis of lime stone; Preparations of various cosmetics such as cold cream, shaving cream, nail polish, shoe polish etc. Various others of practicals may add in accordance with the available facilities.

4th Year; 7th Semester

PAPER-III
Title of the Practicals: APPLIED CHEMISTRY Code: CHEM-423
Credit Hours: 02 Marks: 50

RECOMMENDED BOOKS
2. L.H Sperling “Introduction to Physical Polymer Sciences”, 2nd Ed., John Wiley & Sons