

Federal Urdu University

of Arts, Science and Technology

Syllabus

Applied Chemistry

(BS & MSc)

Department of Chemistry

2012

BS 2 Year Semester-IV

Title of the Course: Applied Chemistry Code: CHEM-121 Credit Hours: 2+0 Marks: 100

Fundamentals of Chemical Industry (7 Credits)

Basic principles and parameters for industrial plant location; Basic chemical data – batch process – Continuous process – flow charts – chemical process solution – design & operation – Managerial for productivity & market evaluation.

Basic and Heavy Chemical Industries (8 Credits)

Raw materials and chemicals; Flow sheet diagrams and commercial production of sulphuric acid, nitric acid, hydrochloric acid, oxalic acid, formic acid, caustic soda and washing soda; Applications of these chemicals in chemical industries.

Glass Industry (5 Credits)

Raw materials and manufacture of glass; Chemistry involved in the production of glass; Types of glass; Glassy state phenomena and annealing of glass; Photochromic and photographic lasses; Production of safety glasses.

Ceramics Industry (5 Credits)

Raw material used for ceramics; Chemistry involved in the production of ceramics articles and wares; Types and classification of ceramic products; Manufacture of ceramics products.

Cement Industry (5 Credits)

Raw materials used for cement production; Chemistry involved in the production of cement; Manufacture of cement by wet and dry processes; Types of cement and composition of clinker. Chemical phenomena and chemistry involved in the hardening and setting of cement.

BS 3rd Year Semester-V M.Sc. (Previous), Semester-I

Title of the Course: Applied Chemistry Code: CHEM-221 Credit Hours: 3+1 Marks: 100

Industrial unit operations (10 Credits)

Enrichment, filtration, distillation, crystallization, drying & Evaporation

Chemical unit processes (15 Credits)

Nitration, sulphonation, oxidation, Alkylation, Halogenation, Hydrolysis and then application in different industries.

Water conditioner & waste water treatment (10 Credits)

Sources of water; Hardness of water; Water treatment and conditioning for municipal and industrial purposes. Steam production and its utilization for power and energy generation; Boiler water treatment; Chemistry involved in the formation of scale; Prevention of scale formation.

Phosphate conditioning – silica removal desecration desalting – municipal waste water – industrial waste water.

Hazards (5 Credits)

Fire or toxic materials pollution control, Environmental protection, pollution control

Chemical Industries in Pakistan (5 Credits)

Location, annual production, Importance, future planning.

Practical

Fifteen experiments shall be conducted based on the following:

- a. Cement Analysis
- b. Analysis of Phosphate rock
- c. Analysis of unknown ore
- d. To estimate the hardness of water in different samples

BS 3rd Year Semester-VI M.Sc. (Previous), Semester-II

Title of the Course: Applied Chemistry Code: CHEM-321 Credit Hours: 3+1 Marks: 100

- 1. Soap & Detergent (3 Credits)
- 2. Paper & pulp (3 Credits)
- 3. Explosives (3 Credits)
- 4. Hydrogenated Oil (4 Credits)
- 5. Petroleum Processing (4 Credits)
- 6. Petrochemical (4 Credits)
- 7. Synthetic Fibers (4 Credits)
- 8. Dyes & Pigments (4 Credits)
- 9. Cosmetic industries (4 Credits)
- 10. Agrichemicals industries (Insecticides, Pesticides & wedicides) (4 Credits)
- 11. Sugar industries (4 Credits)
- 12. Pharmaceutical industries (4 Credits)

Practical

Fifteen experiments shall be conducted based on the following:

- To find out the saponification value of the given oil.
- To determine the iodine value of the given oil
- To determine the acid value of given oil.
- To estimate the percentage of sugar in the given solution of unknown strength.
- To estimate the percentage of acetyl salicylic acid in the given tablet.
- Determination of formaldehyde by iodometric method.
- To estimate the percentage of formaldehyde by peroxide method

Recommended Literature

- Chemical Engineering process by Dadyer and McCabe McGre Hill, New York
- Chemical Engineering process by Badger and bachers.
- Industrial Chemistry by Rodgers.
- Industrial Chemistry by Riegel.
- Chemical Process Industries by Norris Shreve.
- Shrieve Industrial Chemistry.
- Quantitative analysis by Vogel (Inorganic and Organic)
- Amli Sanati Kimya by Farah Kishwar