GUJARAT TECHNOLOGICAL UNIVERSITY

B. Pharm. Semester - 3

Subject Code 230004
Subject Name Pharmaceutical Analysis-I

Sr.No	Course content
1.	**Basics of drugs and formulation analysis :** weights, balances, importance of analysis, quality control and quality assurance, analytical methods (classification, validation parameters), requirements – chemicals (types, purification, checking purity), glasswares (types, calibration, cleaning), sampling techniques, sampling error minimization. Units of concentrations. Errors science, errors minimization.
2.	**Volumetric analysis: Titrimetric analysis :** 2.1. **Acid-base titrations:** Relative strength and its effect on titration, common ion effect, pH, Henderson-Hesselbach equation, buffers, neutralization curve, acid bas indicators, theory of indicators, back titrations, biphasic titrations, pharmacopoeial applications, hydrolysis of salts, ionic products of water and law of mass action. 2.2. **Redox titrations :** Theory of redox titrations, redox indicators, types of redox titrations, iodometry, cerrimetry, mercury metry, diazotization nitrite titrations, 2,6-dichlorophenol indophenol titrations, titration curve and calculations of potentials during course of titrations. 2.3. **Argentometric or precipitation titrations :** Mohrs, Fajans and Volhard methods 2.4. **Nonaqueous titrations :** Nonaqueous solvents, titrants and indicators. Differentiating and leveling solvents. 2.5. **Complexometric titrations :** Theory of the titrations, titrant, indicators and pharmacopoeial applications. 2.6. **Miscellaneous titrations :** Karl-Fischer titrations, Kjeldahl method.
3.	**Gravimetric analysis :** Stability, solubility products, types of precipitations, precipitation techniques, pharmacopoeial applications.
4.	**Extraction techniques :** Simple extraction, multiple extractions, separation of drugs in multicomponent system. Effect of pH on extractability of drugs, continuous extractions.
5.	**Miscellaneous methods:** Oxygen combustion flask method, gasometric method, etc.

Pharmaceutical Analysis-I – Practicals(230004P)

1. Acid-base titrations: Simple, back titrations, titrations of mixtures like NaOH + Na_2CO_3, borax + boric acid.
2. Redox titrations: Simple, iodometry, cerrimetry, 2,6-dichlorophenol-indophenol titrations, mixtures like Fe^{+2} + Fe^{+3}, oxalic acid + sodium oxalate
3. Complexometric titrations: Replacement, back titrations
4. Nonaqueous titrations
5. Argentometric titrations
6. Gravimetric assay of one pharmacopoeial drug
7. Calibrations/cleaning of glasswares and checking precision and lower limit of quantitaiton of titrimetric method

Reference Books:

1. Pharmacopoeia: USP, B.P., I.P.
2. Practical Pharm. Chemistry, Vol. I – Backett, The athlone Press of University of London.
3. Fundamentals of Analytical Chemistry – Skoog, Harcourt College Publishers.
4. Quantitative chemical analysis – Vogel A. I., Pearson Education.
5. Text Book of Pharmaceutical Analsys – K. A. Connor, John Willey & Sons, New York.
6. Quantitative Chemical Analysis – Ayer by Harper & Row, New York..