1. **Title of the Course**: **BASIC CONCEPT IN ANALYTICAL CHEMISTRY**

2. Introduction : Analytical Chemistry courses are in high demand in every industry like agricultural, clinical, pharmaceutical, food processing, petrochemical, etc. In Basic Concept in Analytical Chemistry course, the students know about the identification and quantification of chemical substances. This course is designed from the industrial point of view.

2. Class: B.Sc.III students having chemistry as principle subject

3.Year of Implementation: Syllabus will be implemented from Academic year 2020-21

4. General objectives of course:

a) To equip the student with knowledge in chemical analysis

b) To improve the experimental skills.

c) To improve the reliability of analytical results

d) To develop job oriented skills

e) To strengthened the knowledge of under graduate course

5. Duration: Total 36 hours (Theory 26 hours + Practical's 10 hours)

6. **Syllabus:**

Theory course:

1.Introduction to analytical technique (3)

Definition of analytical science, Qualitative and quantitative analysis, types of instrumental analysis, classification of basic instrumental methods of chemical analysis, safety in analytical laboratory, handling of reagents, harmful substances, fire prevention, first aid in analytical laboratory.

2. Stoichiometric calculations (3)

A) Concentration units, to express analytical results, Stoichiometric calculations related to normality, molarity.

B) How to make rapid routine calculations,

3. Sampling, experimentation and interpretation (9)

A) Drug analysis: assay of drugs, analysis of drugs, TLC of drugs, analysis by UV spectrometric method.

B) Environmental analysis:Sampling definition and explanation, sampling and analysis of air, water and soil.

C) Spectral analysis: different spectrochemical techniques, interpretation of spectral data.

D) Elemental analysis: C,H,N analyzer

4.Principle and instrumentation in Polarimetry, conductometry, colorimetry, spectrophotometry, flame photometry(5)

References:

1. Instrumental methods of analysis by Willard Merit, Dean, Settle.

2. Analytical chemistry by Gary D Christian.

3. Analytical chemistry by B. K.Sharma

4. Analytical chemistry by Alka Gupta

5. Basic concepts of analytical chemistry by S. M. Khopkar

Practical course (only Demonstration): (10 hours)

Determination of cell constant of the conductivity cell

To verify the Lembert Beer's Law using KMnO4/ K2Cr2 O7 solution.

To separate cation mixture by means of chromatography in paper. According to the given distribution coefficients (Rf) of cations, to determine, which cations are in the mixture.

Determination of Trace Metals (Fe, Ni, Cu, Cr and Zn) in Environment Water Samples by Flame Atomic Absorption Spectrometry (FAAS).

Preparation of titrated HCl solution (to make 500 ml titrated 0.1 N HCl solution.)

To standardize the given acid solution (like HCl) pH metrically.

To determine the Refractive Index of given liquid and calculation of specific and molar refractivity.

Setting of a Galvanic Cell and determination of cell voltage

To separate a mixture of O- and p- nitrophenols by steam distillation.

To synthesize O-chlororobenzoic acid from anthranilic acid.

Reference Books :

Systematic Experimental Physical Chemistry: S. W. Rajbhoj, Chondhekar. (Anjali Publication.)

Vogel's Text Book of Quantitative Chemical Analysis. (Longmann) ELBS Edition.

Vogel's Text Book of Qualitative Chemical Analysis. (Longmann) ELBS Edition.

Instrumental methods of Chemical analysis: H. Kaur

Examination pattern and criteria to get a certificate:

Examination is conducted for 100 Marks. Out of 100 marks 70 Marks are assigned for theory based examination and 30 marks for practical related examination. For theory based examination online examination will be conducted one month prior to semester VI examination. For practical examination, oral examination will be conducted related to practical. You will be eligible for a certificate only if average score for theory and practical examination is greater than or equal to 40. Only the e-certificate will be made available.

Course Coordinator and Contact number:

Dr. Nitin S. Patil (Course Coordinator)

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