

# V.V GIRI GOVERNMENT KALASALA, DUMPAGADAPA

Department of Chemistry

## Semester –V

<b>B.Sc</b>	<b>Semester–V(Skill Enhancement Course-Elective)</b>	<b>Credits:4</b>
<b>Course: 7B</b>	<b>AnalyticalMethodsInChemistry-2</b>	<b>Hrs/Wk:4</b>

### **Learning Outcomes:**

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

1. Identify the importance of chromatography in the separation and identification of compounds in a mixture
2. Acquire a critical knowledge on various chromatographic techniques.
3. Demonstrate skills related to analysis of water using different techniques.
4. Understand the principles of spectro chemistry in the determination of metal ions.
5. Comprehend the applications of atomic spectroscopy.

### **Unit-1: Chromatography-Introduction and classification**

**10 hours**

Principle, Classification of chromatographic methods, Nature of adsorbents, eluents,  $R_f$  values, factors affecting  $R_f$  values.

### **Unit-2: TLC and paper chromatography**

**12 hours**

1. Thin layer chromatography: Principle, Experimental procedure, preparation of plates, adsorbents and solvents, development of chromatogram, detection of spots, applications and advantages.
2. Paper Chromatography: Principle, Experimental procedure, choice of paper and solvents, various modes of development- ascending, descending, radial and two dimensional, applications.

### **Unit-3: Column chromatography**

**12 hours**

1. Column chromatography: Principle, classification, Experimental procedure, stationary and mobile phases, development of the Chromatogram, applications.
2. HPLC: Basic principles, instrumentation—block diagram and applications.

### **Unit-4: Spectrophotometry**

**8 hours**

Principle, Instrumentation: Single beam and double beam spectrometer, Beer-Lambert's law- Derivation and deviations from Beer-Lambert's law, applications of Beer-Lambert's law-Quantitative determination of  $\text{Fe}^{+2}$ ,  $\text{Mn}^{+2}$  and  $\text{Pb}^{+2}$ .

### **Unit-5: Atomic spectroscopy**

**8 hours**

Types, atomizer, atomic absorption and emission and applications.

### **References**

1. Fundamentals of Analytical Chemistry by F. James Holler, Stanley R. Crouch, Donald M. West and Douglas A. Skoog, Ninth edition, Cengage.
2. Analytical Chemistry by Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, Seventh edition, Wiley.
3. Quantitative analysis by R. A. Day Jr. and A. L. Underwood, Sixth edition, Pearson.
4. Textbook of Vogel's Quantitative Chemical Analysis, Sixth edition/Pearson.

<b>B.Sc</b>	<b>Semester–V(SkillEnhancementCourse-Elective)</b>	<b>Credits: 1</b>
<b>Course: 7B</b>	<b>AnalyticalMethodsInChemistry-2 Lab</b>	<b>Hrs/Wk:2</b>

### Learning Outcomes:

On successful completion of this practical course, students shall be able to:

1. Perform the separation of a given dye mixture using TLC
2. Learn the preparation of TLC plates
3. Demonstrate the separation of mixture of amino acids using paper chromatography
4. Acquire skills in using column chromatography for the separation of dye mixture

### Practical (Laboratory) Syllabus: (30hrs)

(Max. 50 Marks)

1. Separation of a given dye mixture (methyl orange and methylene blue) using TLC (using alumina as adsorbent).
2. Separation of mixture of methyl orange and methylene blue by column chromatography.
3. Separation of given mixture of amino acids (glycine and phenylalanine) using ascending paper chromatography.
4. Separation of food dyes using Column Chromatography
5. Separation of triglycerides using TLC
6. Verification of Beer Lambert's law. (Using potassium permanganate solution) using colorimeter / spectrophotometer.

### Lab References:

1. Textbook of Vogel's Quantitative Chemical Analysis, Sixth edition, Pearson.
2. Vogel A. I. Practical Organic Chemistry, Longman Group Ltd.
3. Bansal R. K. Laboratory Manual of Organic Chemistry, Wiley-Eastern.
4. Ahluwalia V. K. and Aggarwal R. Comprehensive Practical Organic Chemistry, University press.  
Mann F. G. and Saunders B. C, Practical Organic Chemistry, Pearson Education.