

PAPER CODE:1SC2030312	TITLE OF PAPER: ANALYTICAL CHEMISTRY -II
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Course Objective: Separation techniques are the basis of instrumental analysis widely applied in industry, chemistry, biochemistry, environment science. These techniques are based on principles of chemistry. Therefore in this module we shall study the principles on which these techniques are based and acquire the basic skills necessary to use the techniques. Studying this depends the understanding of the underlying chemistry principles making the learner better able to teach them.

Teaching scheme (hours) per week		Credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	-	4	-	60	40	-	-	100

UNIT	DISCRIPTION IN DETAIL	WEIGHTAGE
I	Chromatography-1 Fundamentals of chromatography, HETP, Resolution, Capacity Factor, Selectivity Factor, Dead time, Dead volume.	25%
II	Chromatography-2 TLC, HPTLC, Ion exchange, Ion chromatography (Principles, Working Applications in separation, purification and identification)	25%
III	High performance liquid Chromatography HPLC, (Principle, theory, instrumentation and applications of high performance liquid chromatography (HPLC) and its comparison with other chromatography. Advanced applications.	25%
IV	Gas Chromatography GC principle, theory, types of columns, packed columns, Capillary columns, Bonded phase columns,, detector types and applications in pharmaceutical analysis. Head space gas chromatography; Pyrolysis gas chromatography; GC-MS.	25%

LEARNING OUTCOMES

- Understanding the principles of chromatographic techniques, with the emphasis on the application in chemistry, biochemistry.
- Updating the recent developments in the field of Chromatography.
- Students can able to design, perform, and interpret chromatographic experiments for biochemical applications.
- Separation techniques are the basis of instrumental analysis widely applied in industry, chemistry, biochemistry, environment science. These techniques are based on principles of chemistry. Therefore in this module we shall study the principles on which these techniques are based and acquire the basic skills necessary to use the techniques.

REFERENCE BOOKS:

1. "Analytical Chemistry" by Gary D. Christian, 6th Edition, John Wiley and Sons Inc. New Jersey.
2. Thin Layer chromatography. By E. Stahi.
3. HPTLC by Dr. P.D. Sethi.
4. Practical Aspects of Gas Chromatography/Mass Spectroscopy by Gordon M. Message, John Wiley & Sons, 1984.
5. High performance liquid chromatography by Dr. P.D. Sethi.
6. "Quantitative Chemical Analysis" by Daniel C. Harris, 5th Edition, W.H. Freeman and Company, New York.
7. Principles of Instrumental Analysis D. A. Skoog and J. L. Loary, W. B. Saunders.
8. Fundamentals of Analytical Chemistry by D.A. Skoog, D. M. West and F. J. Holler, W. B. Saunders.
9. A Practical handbook of preparative HPLC by Donald Wellings, Elsevier, 2006.
10. Pharmaceutical analysis by Dr. S. Ravi Sankar
11. Modern Practice of Gas Chromatography by Robert L. Grob and Eugene F. Barry, 3rd edition, Wiley-Interscience, 1995.
12. Basic Gas Chromatography by Harold M. McNair, James M. Miller, John Wiley and Sons, 2008.
13. Analytical gas Chromatography by Walter Jennings, Eric Mittlefehldt and Philip Stremple, second edition, Elsevier Science, 1997.
14. Modern HPLC for practicing scientists by Michael W. Dong, Wiley Interscience, 2006.