



**DEPARTMENT OF CHEMISTRY
ST. JOSEPH'S COLLEGE (AUTONOMOUS)
TIRUCHIRAPPALLI**

CERTIFICATE COURSE

Basics of Phytochemical Techniques

List of topics to be covered

- Classification of phytochemicals
- Methods of identification and extraction
- Methods of separation
- Spectroscopic methods of identification

Scan for Registration



**Registration Fee
Rs. 1000**

Limited seats available!

**Course Coordinator:
Dr. A. Arun Viveke
Assistant Professor
Department of Chemistry
Tiruchirappalli**

Semester	Course Code	Title of the Course	Hours	Credits
Even-2024		Certificate Course: Basics of Phytochemical Techniques	45	2

Unit I: Introduction to Phytochemistry

Phytochemicals- secondary plant metabolites- classification of phytochemicals- phenolics, terpenes, terpenoids, organonitrides, organosulfides and others (only structure and functions).

Unit II: Methods of identification and extraction

Qualitative tests for different types of phytochemicals, Hagers test, Liebermann Burchard test, ferric chloride test, bromine water test, test for proteins, test for free amino acids, test for carbohydrate, Salkowski test.

Unit III: Methods of extraction

Solvation, Different types of solvents, polarity index, choice of solvents, solvent extraction, maceration, percolation, hot extraction. continuous soxlet extraction and super critical fluid extractions.

Unit III: Methods of separation

General introduction to separation techniques- chromatographic techniques -thin layer chromatography - Column chromatography - Flash chromatography and HPLC.

Unit IV: Spectroscopic methods of identification

UV spectroscopy- chlorophyll, Cytochromes, anthocyanin and betacyanin and carotenoids. IR spectroscopy- stretching frequency of alkenes, aromatics, carbonyl groups, amines, cyanides and carboxylic acids. (visit to ACIC)

Unit V: Advanced spectroscopic methods

Mass spectroscopy- fragmentation peak and molecular ion peak, NMR spectroscopy chemical shifts, simplified approach to identification of simple phytochemicals. (visit to central instrumentation facility)

Teaching Methodology	Videos, PPT, demonstration, and visits to instrumentation facility
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Books for Reference

1. Harborne, J B (1998) *Introduction to Phytochemistry*, (3rd ed.), Chapman & Hall, London.
2. Egbuna, C, Ifemeje, J C, Kryeziu, T L, Udedi, S C, Kumar S (2018) *Phytochemistry: fundamentals, modern techniques and applications* (4th ed.), CRC Press, Florida, USA. (Chapter 1)
3. Silverstein R M, Bassler, G C, (1993), *Spectrometric Identification of Organic Compounds*, (4th ed.), John- Wiley and Sons.
4. Jeffery, G. H., Bassett, J., Mendham, J. & Denney R. C. (1989) *Vogel's Textbook of Quantitative Chemical Analysis*, (5 th Ed.), Longman Scientific and Technical, Essex, England.