School of Science

M.Sc. (Chemistry) Programme

Subject Code & Name: - MS02ECHE01 & Analytical Chemistry

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				Internal		External	
L	T	P	Total	TH	PWE	TH	PWE
2	-	2	4	25	25	25	25

Programme Name	M.Sc. Chemistry
Semester	II
Course Code	MS02ECHE01
Course Title	Analytical Chemistry
Course Content Type (Th./Pr.)	Theory
Course Credit	4
Sessions+ Lab. Per Week	4
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. An introduction to analytical chemistry and a summary of significant analytical techniques are provided in this course.
2. A review is given of significant analytical techniques from the fields of separation, spectrochemical and spectrophotometric analysis, electrochemical analysis, and classical analysis.
3. The course also covers key methods and techniques in analytical chemistry, risk assessment of chemical experiments, analysis of actual samples, and evaluation and interpretation of results in addition to theory on sampling.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. In this course, learners will gain an overview of the important use of selected classical and instrumental methods and a short introduction to their basic theory.
2. The basic knowledge of various significant laws, SOPs, and GMPs pertaining to the food and pharmacy industries in India was also taught in this course.

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3.	It also provides the skill for selection of proper analytical techniques to solve the analytical problems.

Detailed Contents		
UNIT	**TOPIC/SUB-TOPIC**	**TEACHING HOURS**
I	**Spectro-analytical Techniques** Fundamental of spectroscopy, electromagnetic radiations and their properties. Introduction to absorption and emission spectroscopy. Lambert-Beer law. **Atomic absorption spectroscopy:** Basic principle, theory, instrumentation and applications. Advantages over flame photometry.	15
II	**Separation Methods:** Introduction & classification of various separation methods. Chromatography techniques: General introduction, Principles and classification of chromatography according to types of chromatographic bed, physical state of mobile phase, mechanism of separation.	15

Text Book(s)

1. Skoog, West, Holler, Grouch "Foundamental of Analytical Chemistry" Eight edition, Cengage
2. B. K. Sharma. "Instrumental method of chemical analysis" 28th edition, GOEL Publishing house Meerut. 2012.

Reference Books

1. Textbook of Polymer Science by F. W. Billmeyer, Wiley – Interscience, New YorkR. A. Day, Jr , A. L. Underwood., "Quantitative analysis" 6th edition, Prentice -Hall of India Private Limited, New Delhi. 2006.
2. B. Sivasankar, "Instrumental Methods of Analysis" Oxford University Press, 2012.
3. Vogel Textbook of Quantitative Analysis, 3rd and 7th Edition.
4. Instrumental Methods of Chemical Analysis by Gurdeep R. Chatwal & Sham K. Anand, Himalaya Publishing House Fifth Revised and Enlarged Edition.

Web Resources

1. www.nptel.ac.in
2. www.swayam.gov.in
3. www.epgp.inflibnet.ac.in (e-PG pathshala)
4. www.ndl.iitkgp.ac.in (National Digital Library)

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Required Software(s) (if any)
Practical(s) (if any)
Analytical Practicals: 1. To determine the amount of copper sulphate by spectrophotometric titration 2. To determine the COD value of the given water sample 3. To determine the percent purity of vanillin sample 4. To determine % purity of $K_3[Fe(CN)_6]$. 5. Determination of anionic surfactant in a given sample of water 6. Determination of iron in the given sample 7. Determination of Sodium and potassium by flame photometry 8. To determine quinine by flourimetry

L:: Lecture, **T::** Tutorial , **P::**Practical

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)