

# **ST. XAVIER'S COLLEGE (AUTONOMOUS)**

## **AHMEDABAD**

### **Chemistry Syllabus**

**for**

**Four-Year Undergraduate Programme**

**as per**

**National Education Policy (NEP-2020)**

**(Semester I)**



**(EFFECTIVE FROM JUNE 2023)**

**ST. XAVIER'S COLLEGE (Autonomous), AHMEDABAD  
Chemistry**

**Theory syllabus**

**PROGRAMME SPECIFIC OUTCOMES**

A student completing this program will be able to

**PSO1: Knowledge:** Apply the principles of analytical, organic, inorganic and physical chemistry to solve basic chemical problems locally and globally

**PSO2: Laboratory skills:** Employ classical and modern laboratory techniques in the performance and documentation of experiments, suitable for a chemical industry or a chemistry graduate program.

**PSO3: Environmental concern:** Practice environmentally benign chemistry

**PSO4: Employability/future prospects:** Develop problem-solving skills and aptitude that are highly valuable to employers and entrepreneurship skills for self-employment

**PSO5: Scientific communication:** Have effective written and oral scientific communication skills, especially the ability to transmit complex technical information in a clear and concise manner.

## St. Xavier's College (Autonomous), Ahmedabad

**Syllabus of Semester – I of the following department under Faculty of Science based on Under Graduate Curriculum Framework - 2023 to be implemented from the Academic Year 2024-25.**

### FACULTY OF SCIENCE

### DEPARTMENT OF CHEMISTRY

Course	Title	Content	Hours/week	Credit
DSC-1 (Theory)				
DSC-1 (Lab)				
Minor-1 (Theory)				
Minor-1 (Lab)				
SEC	Separation Methods in Chemistry	UNIT- 1: Physical methods of separation (Theory) UNIT-2: Practicals based on Theory	1+2 =3 hrs	2
MDC (Theory)				
MDC (Practical)				
AEC				
VAC				

**Syllabus of Semester – I of the following departments under Faculty of Science based on Under Graduate Curriculum Framework - 2023 to be implemented from the Academic Year 2024-25.**

**FACULTY OF SCIENCE**

**DEPARTMENT OF CHEMISTRY**

**BSc. (Hons.) Chemistry  
Category – IV**

**Skill Enhancement Course: Separation Methods in Chemistry**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	Tutorial	Practical / Practice		
Separation Methods in Chemistry (CH-1650)	1	0	1 (2 hours)	10 + 2 from a recognized board in any stream	Basics laboratory knowledge of Chemistry

**LEARNING OBJECTIVES (LO)**

On completion of this course, the student will be able-

**LO1:** To introduce the concepts involved for the use of various distillation techniques

**LO2:** To introduce the concepts of solvent extraction and explain their applications in the chemical industry

**LO3:** To explain the various types of chromatographic techniques and their applications in the chemical laboratory

**COURSE OUTCOME (CO)**

On Completion of this course, the student has been able to-

**CO1:** Apply the principles of solvent extraction for separation of simple chemical mixtures

**CO2:** Use the principles of distillation to separate a variety of liquid mixtures

**CO3:** Use the principles of chromatography to separate simple mixtures by TLC & Paper chromatography

**UNIT- 1 Physical methods of separation (Theory)**

**[15L]**

(a) Distillation and types of distillations, (1) Simple Distillation (2) Fractional Distillation (3) Steam Distillation

(b) Basics of Solvent Extraction, Principle of solvent extraction, Illustrations of Solvent Extraction.

(c) Classification of Chromatographic Techniques, (based on mobile phase and type of equilibria) ; (1) Paper Chromatography: Nature of Stationary Phase, Development of Chromatograph. (2) TLC: Nature of separation, technique of TLC, Process of development of plate, quantitative determination

**Practical: Practicals based on Theory**

(1) Paper Chromatography: (Separation of amino acids)

(2) Paper Chromatography: (Separation of group cations)

(3) TLC of Ibuprofen

(4) TLC of Aspirin

(5) TLC of pure dyes

(6) TLC of dye mixture

(7) Distillation of two immiscible solvents

(8) Demonstration of solvent extraction

**Suggestive Reading:**

1. Basics of analytical chemistry by S. M. Khopkar
2. Instrumental methods of chemical analysis by H Kaur
3. Instrumental methods of chemical analysis by G. Chatwal and S. Anand
4. Essentials of Physical chemistry by Bahl and Tuli

**Suggested Online Links/Readings:**

<https://swayam.gov.in>

[www.ncert.in](http://www.ncert.in)

<https://books.google.co.in>

**Pedagogy:**

1. Lecture method with teaching aids.
2. Audio-Visual Teaching mode with Projector Method.
3. Practical work & demonstration
4. Dialogue and context-based class.
5. Assignments, Learning seminar, Class Test etc.

**MODE OF EVALUATION:**

ASSESSMENT	MARKS
INTERNAL	
Attendance	05
Assignments	05
Continuous Internal Assessment I and II	15
TOTAL	25 marks
EXTERNAL	
End Semester Exam	25 marks

Students will prepare and present (in pairs) a Submission related to the topic of Assignment/ practical tasks on allotted topics. These Submission will be form of Activity/ Hand written notes etc. Points for evaluation: Presentation (20%) + Content (20%) + explanation (20%) +Creativity (20%) + Overall impression (20%).