

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

## **AHMEDABAD**

### **Chemistry Syllabus**

**for**

**Four-Year Undergraduate Programme**

**as per**

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

**(Semester II)**



**(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 – II of the following department under Faculty of Science based on Under Graduate Curriculum Framework - 2023 to be implemented from the Academic Year 2023-24.**

### FACULTY OF SCIENCE

### DEPARTMENT OF CHEMISTRY

Course	Title	Content	Hours/week	Credit
DSC-1 (Theory)			4 hrs	4
DSC-1 (Lab)			8 hrs	4
Minor-1 (Theory)			2 hrs	2
Minor-1 (Lab)			4 hrs	2
SEC	Basics of analytical chemistry for lab practices	UNIT- 1 Good Laboratory practices UNIT-2 Basic lab practice and SOP for instruments.	4 hrs	2
MDC (Theory)	Sustainable Environment	Unit -1- Biogeochemical cycles and Green chemistry Unit -2- Environmental Analysis and Water analysis	2 hrs	2
MDC (Practical)	Sustainable Environment	Practical based as per Theory syllabus.	2 hrs	2
AEC	English	(To be offered by the concerned subject Department)		
VAC		(To be offered by the concerned subject Department)		

**Syllabus of Semester – II of the following departments under Faculty of Science based on Under Graduate Curriculum Framework - 2023 to be implemented from the Academic Year 2023-24.**

**FACULTY OF SCIENCE**

**DEPARTMENT OF CHEMISTRY**

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

**Skill Enhancement Course: Basics of analytical chemistry for lab practices.**

**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		
Basics of analytical chemistry for lab practices. (CH-2650)	2	0	0	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 understand the basic Chemistry laboratory practices and operations.

**LO2:** To gain knowledge about important safety measures in all aspects for Chemistry laboratory operation and safety measures.

**COURSE OUTCOME (CO)**

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

**CO1:** Develop skills as required for developing a functional chemistry Laboratory.

**CO2:** Explain various Chemistry safety measures and discuss minimum requirement to use hazardous and toxic chemicals in laboratory.

**CO3:** Students gain knowledge for the preparation of chemicals and practical applications of instruments and apparatus used in the chemistry laboratory.

**UNIT- 1 Good Laboratory practice****[15L]**

Introduction, Protective Equipment , Standard Operating Procedures for Work with Hazardous Substances , Procedures for Work with Particularly Hazardous Substances, Accidents and Emergencies, General Procedures for Work with Toxic Substances, Disposal of Excess and Waste Chemicals, Specific Hazards Lead to Fires or Explosions. Procedures for Work with Particularly Hazardous Substances

**UNIT-2 Basic lab practice and SOP for instruments.**

(1) S.O.P. of pH meter, conductometer , potentimeter, colorimeter, hot air oven, desicator, waterbath, U.V. Chamber, U.V. visible spectrophotometer, magnetic stirrer, weighing balance, their standardization methods.

(2) Concentration systems: molarity, formality, normality, wt% ppm, milliequivalence and millimoles-problems based on chemistry practical

**Suggestive Reading:**

- 1.Evert, R. F., Eichhorn, S. E., Perry, J.B. (2012). Laboratory Topics in Botany. W.H. Freeman and Company.
- 2.Mesh, M.S., Kebede-Westhead, E. (2012). Essential Laboratory Skills for Biosciences. John Wiley & Sons, Ltd.
- 3.Mu, P., Plummer, D. T. (2001). Introduction to practical biochemistry. TataMcGrawHill Education.
- 4.Mann, S. P. (2016). Introductory Statistics, 9th edition. Hoboken, NJ, John Wiley and Sons Inc.
- 5.Daniel, W.W. (1987). Biostatistics. New York, NY: John Wiley Sons.
- 6.Jones, A.M., Reed, R., Weyers, J. (2016). Practical Skills in Biology, 6th Edition, Pearson
- 7.Bisen, P.S. (2014). Laboratory Protocols in Applied Life Sciences, 1st edition. CRC Press

**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. Dialogue and context-based class.
4. Assignments, Learning seminar, Class Test etc.
5. Open Online Sources and Tutorials

**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%).