FIRST-YEAR OF BACHELOR OF SCIENCE CHEMISTRY (MAJOR AND MINOR) REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: CHEMISTRY PRACTICAL-II
SEMESTER-II
W.E.F. 2023-2024

RECOMMENDED BY THE BOARD OF STUDIES IN CHEMISTRY
AND
APPROVED BY THE ACADEMIC COUNCIL

Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangameshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: 03 dated 08 July 2023

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangameshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Chemistry
Name of the Class	:	First Year
Semester	:	Second
No. of Credits	:	02
Title of the Course	:	Chemistry Practical-II
Course Code	:	S106CHP
Name of the Vertical in adherence to NEP 2020	:	Major and Minor
Eligibility for Admission	:	Any 12^{th} Pass science learner seeking admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Summative at the end of semester
Level	:	UG
Pattern of Marks Distribution for SEE	:	100 %
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2023-2024
Ordinances /Regulations (if any)		

Syllabus for First Year of Bachelor of Science in Chemistry

(With effect from the academic year 2023-2024)

SEMESTER-II

Course Title: Chemistry Practical-II **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S106CHP**

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to…		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Understand	explain Henderson's equation and Beer Lambert's law.
CLO-02	Apply	determine rate constant and dissociation constant for various reactions.
CLO-03	Analyse	analyse inorganic salts as well as organic compounds by qualitative analysis methods.

Syllabus for First Year of Bachelor of Science in Chemistry

(With effect from the academic year 2023-2024)

SEMESTER-II

Course Title: Chemistry Practical-II **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S106CHP**

COURSE CONTENT			
Sr. No.	**Content**	**Credits**	**No. of Hours**
1	**Physical Chemistry** 1. Determination of the rate constant for the saponification reaction between ethyl acetate and NaOH 2. Determination of dissociation constant of weak acid (Ka) using Henderson's equation and the method of incomplete titration pH metrically. 3. Verification of Beer-Lambert's law, using KMnO4 solution by colorimetric method.	02	30
2	**Inorganic Chemistry** **1. Qualitative analysis:** (at least 4 mixtures to be analyzed) Semi-micro inorganic qualitative analysis of a sample containing two cations and two anions. Cations (from amongst): Pb^{2+}, Ba^{2+}, Ca^{2+}, Sr^{2+}, Cu^{2+}, Cd^{2+}, Fe^{2+}, Ni^{2+}, Mn^{2+}, Mg^{2+}, Al^{3+}, Cr^{3+}, K^{+}, NH^{4+} Anions (From amongst): CO^{2-}, S^{2-} , SO^{2-} , NO^{-} , NO^{-} , Cl^{-} , Br^{-} , I^{-} , SO^{2-} , PO^{3-} (Scheme of analysis should avoid use of sulphide ion in any form for precipitation/separation of cations.)		
3	**2. Redox Titration:** To determine the percentage of copper (II) present in a given sample by titration against a standard aqueous solution of sodium thiosulfate (iodometry titration) **Organic Chemistry** Identification of organic compound containing C, H, (O), N, S, X elements. (Minimum 6 compounds)		
	Total	**02**	**30**

Access to the Course

The course is available for all the students admitted for Bachelor of Science.

Methods of Assessment

Vocational Skill Courses, Skill Enhancement Courses and the courses having laboratory sessions shall be assessed at the end of each semester.

Reference Books

Unit I: Physical Chemistry

1. Khosla B.D., Garg V.C. and Gulati A., Senior Practical Physical Chemistry, R. Chand and Co., New Delhi (2011).

2. Garland C. W., Nibler J.W. and Shoemaker D.P., Experiments in Physical Chemistry, 8thEd., McGraw-Hill, New York (2003).

3. Halpern A.M. and McBane G.C., Experimental Physical Chemistry, 3rd Ed., W. H. Freeman and Co., New York (2003).

4. Athawale V.D. and Mathur P., Experimental Physical Chemistry, New Age International, New Delhi (2001).

Unit II: Inorganic Chemistry

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.

Unit III: Organic Chemistry

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)

2. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry,5th Ed., Pearson (2012)

3. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.