FIRST-YEAR OF MASTER OF SCIENCE CHEMISTRY REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: PHYSICAL & INORGANIC CHEMISTRY PRACTICAL-I
SEMESTER-I
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	:	Master of Science
Name of the Department	:	Chemistry
Name of the Class	:	First Year
Semester	:	First
No. of Credits	:	02
Title of the Course	:	Physical and Inorganic Chemistry Practical-I
Course Code	:	S507CHP
Name of the Vertical in adherence to NEP 2020	:	Elective
Eligibility for Admission	:	Chemistry Graduate learner seeking Admission to Post Graduate 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	:	PG
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 Master of Science in Chemistry

(With effect from the academic year 2023-2024)

SEMESTER-I

Course Title: Physical & Inorganic Chemistry Practical-I **No. of Credits - 02**

Type of Vertical: Elective **COURSE CODE: S507CHP**

Learning Outcomes of Physical Chemistry Practicals 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	Apply	sketch plots of various mathematical function.
CLO-02	Analyse	calculate equilibrium constant and electrolyte nature of inorganic species.
CLO-03	Evaluate	estimate amount of metal cations by complexometric titration method and breakthrough capacity of resin.
CLO-04	Create	perform standardisation procedures for laboratory instruments and prepare standard solutions of various concentrations and synthesize different inorganic complexes.

Syllabus for First Year of Master of Science in Chemistry

(With effect from the academic year 2023-2024)

SEMESTER-I

Course Title: Physical & Inorganic Chemistry Practical-I **No. of Credits - 02**

Type of Vertical: Elective **COURSE CODE: S507CHP**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Hours**
1	**Physical Chemistry Practicals:** **Non – Instrumental:** o To determine the heat of solution (ΔH) of a sparingly soluble acid (benzoic /salicylic acid) from solubility measurement at three different temperature. o To study the variation of calcium sulphate with ionic strength and hence determine the thermodynamic solubility product of CaSO4 at room temperature. o To investigate the reaction between acetone and iodine. **Instrumental:** o To determine the mean ionic activity coefficient of an electrolyte by e.m.f. measurement. o To study the effect of substituent on the dissociation constant of acetic acid conductometrically.	1	30
2	**Inorganic Preparations (Synthesis and Characterization)** o Bis-(tetraethylammonium) tetrachloro Cuprate (II) $(Et_4N)_2[CuCl_4]$ o Bis-(tetraethylammonium) tetrachloro Nickelate (II) $(Et_4 N)_2 [NiCl_4]$ o Bis-(tetraethylammonium) tetrachloro Cobaltate (II) $(Et_4 N)_2 [CoCl_4]$ **Instrumental:** o Determination of equilibrium constant by Slope intercept method for Fe^{+3}/ SCN system.	1	30
	Total	**2**	**60**

Access to the Course

The course is available for all the students admitted for Master 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.

References:

1. Practical Physical Chemistry, B. Viswanathan and P.S. Raghavan, Viva Books Private Limited, 2005.
2. Practical Physical Chemistry, A.M. James and F.E. Prichard, 3rd Edn., Longman Group Ltd., 1974.
3. Experimental Physical Chemistry, V.D. Athawale and P. Mathur, New Age International Publishers, 2001.
4. Vogel's textbook of quantitative chemical analysis, Sixth Ed. Mendham, Denny, Barnes, Thomas, Pearson education.
5. Advanced experiments in Inorganic Chemistry., G. N. Mukherjee., 1st Edn., 2010., U. N. Dhur & Sons Pvt Ltd
6. The Synthesis and Characterization of Inorganic Compounds by William L. Jolly
7. Inorganic Chemistry Practical Under UGC Syllabus for M.Sc. in all India Universities By: Dr Deepak Pant.
8. Quantitative Inorganic Analysis including Elementary Instrumental Analysis by A. I. Vogels, 3rd Ed. ELBS (1964)
9. Vogel's textbook of quantitative chemical analysis, Sixth Ed. Mendham, Denny, Barnes, Thomas, Pearson education
10. Standard methods of chemical analysis, F. J. Welcher
11. Standard Instrumental methods of Chemical Analysis, F. J. Welcher
12. W. W. Scott, "Standard methods of Chemical Analysis", Vol. I, Van Nostrand Company, Inc.,1939.