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**SECOND-YEAR OF MASTER OF SCIENCE  
ANALYTICAL CHEMISTRY REVISED SYLLABUS  
ACCORDING TO CBCS NEP2020**

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**COURSE TITLE: ENVIRONMENTAL CHEMISTRY  
SEMESTER-III  
W.E.F. 2024-2025**

**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:

|   |   |   |
|---|---|---|
| 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                             | : | Second Year   |
| Semester                                      | : | Third   |
| No. of Credits                                | : | 02  |
| Title of the Course                           | : | Environmental Chemistry   |
| Course Code                                   | : | S605CHT   |
| 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                            | : | Formative   |
| Level   | : | PG  |
| Pattern of Marks Distribution for SEE and CIA | : | 60:40   |
| Status  | : | NEP-CBCS  |
| To be implemented from Academic Year          | : | 2024-2025   |
| Ordinances /Regulations (if any)              |   |   |

## Syllabus for second Year of Master of Science in Chemistry

(With effect from the academic year 2024-2025)

**SEMESTER-III**

**Paper No.- V**

**Course Title: Environmental Chemistry**

**No. of Credits - 02**

**Type of Vertical: Elective**

**Course Code: S605CHT**

**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  | Remember        | Recall basic concept of air pollution.  |
| CLO-02  | Understand      | Explain sampling and analysis of various content present in air.              |
| CLO-03  | Apply           | Illustrate sources, effects and control measures of environmental pollutions. |

## Syllabus for second Year of Master of Science in Chemistry

(With effect from the academic year 2024-2025)

**SEMESTER-III**

**Paper No.- V**

**Course Title: Environmental Chemistry**

**No. of Credits - 02**

**Type of Vertical: Elective**

**Course Code: S605CHT**

| <b>COURSE CONTENT</b> |  |                |                     |
|-----------------------|--|----------------|---------------------|
| <b>Module No.</b>     | <b>Content</b>   | <b>Credits</b> | <b>No. of Hours</b> |
| 1                     | <b>Unit 1: Air Pollution</b> <ul style="list-style-type: none"><li>• Sources, classification, pollutants and permissible limits.</li><li>• Sampling methods for air, flew gas, Industrial Exhaust, stag samples etc.</li><li>• Importance of automobile exhaust control and its limits</li><li>• Sampling and analysis of: Particulate matter, aerosols, ammonia and organic vapors.</li><li>• Carbon credit and global issues related to air pollution.</li><li>• Greenhouse gases and their substitutes.</li><li>• Environmental Legislation: role of pollution control boards, article 48A and 51A, Motor Vehicle Act and method of analysis with respect to PUC.</li></ul>   | 01             | 15                  |
| 2                     | <b>Unit 2: Other Type of Pollution</b> <ul style="list-style-type: none"><li>• Soil pollution and Soil Analysis : sources of soil pollution and their control, sampling of soil, determination of water holding capacity, determination total nitrogen, ammonia and nitrates, fertility of soil and effect of pollution on it, synthetic fertilizers and their long term effect on soil quality.</li><li>• Noise Pollution: sources, effects, methods of measurements and control measures.</li><li>• Thermal Pollution: definition, source, impact, control measures, working of cooling towers and cooling ponds, involved economy.</li><li>• Radioactive pollutants: source, exposure hazards, precautions in handling and safety, Long term effects.</li></ul> | 01             | 15                  |

|  |   |          |           |
|--|---|----------|-----------|
|  | <ul style="list-style-type: none"><li>• Environmental Audits: concept of audit, authorities, evaluation methodology, benefits and certification</li></ul> |          |           |
|  | <b>Total</b>  | <b>2</b> | <b>30</b> |

### Access to the Course

The course is available second year students admitted for Master of Science.

### Methods of Assessment

The assessment pattern would be 60:40, 60% for Semester End Examination (SEE) and 40% for Continuous Internal Assessment (CIA). The structure of the SEE and CIA would be as recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

### References:

1. Environmental Chemistry, A. K. De, 2nd ED. Wiley (1989).
2. Environmental Pollution Analysis, S. M. Khopkar, John Wiley (1993).
3. Air Pollution Sampling And Analysis, Sharad Gokhale, IIT Guwahati, May 2009.
4. Environmental Pollution Analysis, S. M. Khopkar, New Age International publication (2011).
5. Soil pollution, S.G. Misra and Dinesh Mani, APH Publishing Corporation, (2009).
6. Soil Pollution: origin, monitoring and remediation, Abraham Mirsal, Springer (2010).
7. Noise Pollution, Donald F Anthrop, Lexington Books, (1973)
8. Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise (1981) Available at NCL laboratories e- Library.
9. Chemistry, Emission Control, Radioactive Pollution and Indoor Air Quality Edited by Nicolas Mazzeo, InTech Publications (2011).