

Date: 01/09/2023

To
The Principal
Shri. Mohatadevi Shikshan Sanstha
Pragati Mahavidyalaya
Sawkheda, Tq. Sillod
Dist. Aurangabad (Chhatrapati Sambhajanagar)

Subject: Application for Running the Certificate Course Entitled "*Environmental Chemistry*"

Respected Sir,

I hope this letter finds you in good health and high spirits. I am writing to seek your esteemed approval for conducting a certificate course entitled "*Environmental Chemistry*" for the Chemistry Department students in the academic year 2023-24.

The proposed course is designed to enhance the students' understanding of the critical interplay between chemistry and environmental issues. It will cover a range of topics, including the chemical aspects of environmental pollution, waste management, and sustainable practices. The course will span 32 hours and is aimed at providing practical knowledge and skills that are crucial in today's context of increasing environmental concerns.

The details of the course are as follows:

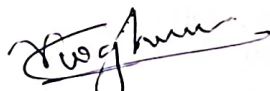
- **Course Title:** Environmental Chemistry
- **Duration:** 32 hours
- **Target Audience:** Chemistry Department Students
- **Academic Year:** 2023-24

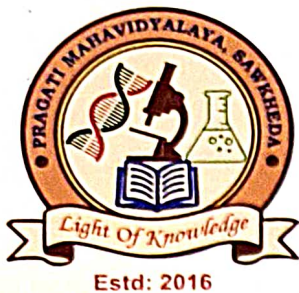
The course will be conducted by experienced faculty members and will include lectures, practical sessions, and case studies to ensure a comprehensive learning experience. It is designed to complement the existing curriculum and provide students with an additional qualification that will be beneficial for their academic and professional growth.

I kindly request you to grant approval for this course and make the necessary arrangements to facilitate its implementation. Your support in this regard will greatly contribute to the academic enrichment of our students and align with our institution's commitment to excellence in education.

Thank you for considering this application. I look forward to your favorable response.

Yours faithfully,


Mr. C. K. Waghmare
Head of Department, Chemistry
Pragati Mahavidyalaya
Sawkheda, Tq. Sillod
Dist. Aurangabad (Chhatrapati Sambhajanagar)



Shri Mohatadevi Shikshan Sanstha, Aurangabad.

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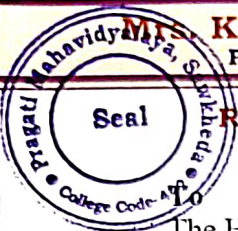
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College Code: 442 Exam. Center Code: 291

Website: www.pragatisawkheda.co.in

Email: pragatiiqac2016@gmail.com, pragatimahavidyalaya442@gmail.com

Contact: 9822021784, 8888611717



Kaveri Palkar
President

Mrs. Archana Mukhekar
Secretary

Dr. Varsha Phalke
Principal

Ref No.: PMS/2023-2024/01

Date: 06/09/2023

The Head of Department, Chemistry
Pragati Mahavidyalaya
Sawkheda, Tq. Sillod
Dist. Aurangabad (Chhatrapati Sambhajnagar)

Subject: Sanction for Running the Certificate Course Entitled "*Environmental Chemistry*"

Dear HOD.

I am pleased to inform you that your application for conducting the certificate course entitled "*Environmental Chemistry*" has been reviewed and approved.

The details of the sanctioned course are as follows:

- **Course Title:** Environmental Chemistry
- **Duration:** 32 hours
- **Target Audience:** Chemistry Department Students
- **Academic Year:** 2023-24

The course aims to provide students with valuable insights into the chemical dimensions of environmental issues and foster a deeper understanding of sustainable practices. The inclusion of lectures, practical sessions, and case studies will enhance the students' learning experience and contribute significantly to their academic and professional development.

Please proceed with the necessary arrangements for the course, including finalizing the schedule, coordinating with the faculty, and ensuring all required resources are available. Additionally, ensure that the course is well-communicated to the students and that they are informed about the registration process and course requirements.

Should you require any further assistance or have any queries regarding the implementation of the course, please do not hesitate to contact my office.

Congratulations on the approval of this initiative, and I wish you and the students a successful and enriching learning experience.

Yours sincerely,

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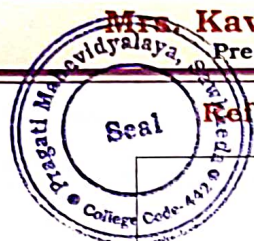
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Date : 11 / 09 / 2023

Department of Chemistry

Notice

Subject: Certificate Course on "Environmental Chemistry"

Dear Students,

We are pleased to announce that the Department of Chemistry will be offering a certificate course entitled "*Environmental Chemistry*" for the academic year 2023-24.

Course Details:

- **Course Title:** Environmental Chemistry
- **Duration:** 32 hours
- **Objective:** To provide an in-depth understanding of the chemical aspects of environmental issues, including pollution, waste management, and sustainable practices.

The course will include lectures, practical sessions, and case studies designed to enhance your knowledge and skills in this crucial area of study. This course is an excellent opportunity for you to gain additional qualification and expertise that will be valuable in both academic and professional contexts.

Please visit the Chemistry Department office to fill out the registration form.

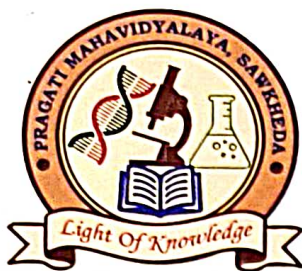
We encourage all interested students to enroll in this course and take advantage of this opportunity to broaden your knowledge in environmental chemistry.

For any further information or queries, feel free to contact the Department office.

Head of Department, Chemistry

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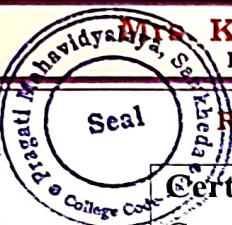
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Certificate Course Syllabus: Environmental Chemistry

Course Duration: 32 hours

Target Audience: Chemistry Department Students

Academic Year: 2023-24

Week 1: Introduction to Environmental Chemistry

Hours: 4

- **Lecture 1:** Overview of Environmental Chemistry
 - Definition and scope
 - Importance of environmental chemistry
 - Key concepts and terminology
- **Lecture 2:** Environmental Systems and Cycles
 - Earth's spheres: Atmosphere, Hydrosphere, Lithosphere, and Biosphere
 - Biogeochemical cycles: Carbon, Nitrogen, Phosphorus, and Sulfur cycles

Week 2: Chemical Pollution

Hours: 4

- **Lecture 3:** Air Pollution
 - Sources of air pollutants
 - Types of air pollutants: Gases and particulates
 - Effects on human health and the environment
- **Lecture 4:** Water Pollution
 - Sources and types of water pollutants
 - Chemical oxygen demand (COD) and biological oxygen demand (BOD)
 - Impacts on aquatic ecosystems and human health

Week 3: Waste Management

Hours: 4

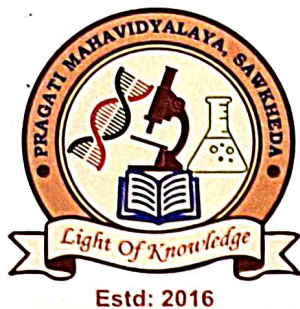
- **Lecture 5:** Solid Waste Management
 - Types of solid waste
 - Waste segregation and disposal methods
 - Recycling and composting
- **Lecture 6:** Hazardous Waste
 - Classification and handling of hazardous waste
 - Treatment and disposal techniques
 - Environmental and health risks

Week 4: Analytical Techniques in Environmental Chemistry

Hours: 4

- **Lecture 7:** Sampling and Analysis

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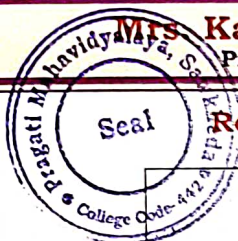
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- Methods of environmental sampling
- Analytical techniques: Spectroscopy, Chromatography, and Mass Spectrometry
- **Lecture 8: Data Interpretation and Environmental Monitoring**
 - Interpretation of analytical data
 - Monitoring programs and regulatory standards

Week 5: Environmental Chemistry and Sustainability

Hours: 4

- **Lecture 9: Green Chemistry**
 - Principles of green chemistry
 - Sustainable practices and innovations
- **Lecture 10: Case Studies in Environmental Chemistry**
 - Real-world case studies
 - Problem-solving and discussions

Week 6: Practical Applications and Case Studies

Hours: 4

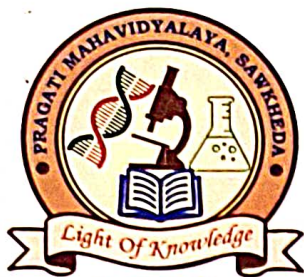
- **Practical 1: Laboratory Analysis of Pollutants**
 - Hands-on lab sessions on water and air quality testing
- **Practical 2: Waste Management Practices**
 - Demonstration of waste segregation and recycling techniques

Week 7: Review and Examination

Hours: 4

- **Review Session:** Recap of key concepts and topics covered
- **Final Examination:** Written test to assess understanding and application of course material

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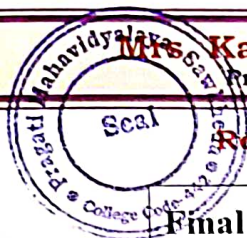
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Final Examination: Environmental Chemistry

Total Marks: 30

Duration: 1.5 hours

Instructions: Choose the most appropriate answer for each question.

Multiple Choice Questions

- Which of the following is NOT a major component of air pollution?
 - Carbon dioxide
 - Sulfur dioxide
 - Nitrogen oxide
 - Oxygen
- What is the primary source of nitrogen oxides in the atmosphere?
 - Industrial emissions
 - Vehicle exhaust
 - Natural vegetation
 - Oceanic evaporation
- The process of removing dissolved and suspended solids from wastewater is known as:
 - Sedimentation
 - Filtration
 - Chlorination
 - Coagulation
- What is the main cause of the greenhouse effect?
 - Methane
 - Oxygen
 - Nitrogen
 - Argon
- Which chemical is commonly used to measure water quality by indicating the level of organic matter?
 - pH
 - COD
 - BOD
 - TDS
- Which of the following cycles involves the movement of sulfur through the environment?
 - Carbon cycle
 - Nitrogen cycle
 - Phosphorus cycle
 - Sulfur cycle

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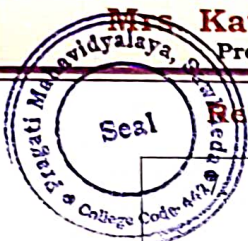
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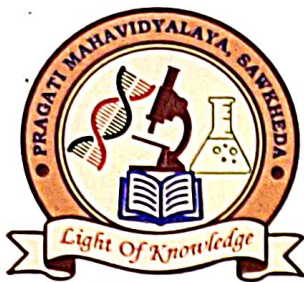
The term 'biodegradable' refers to substances that:

- Are resistant to decomposition
 - Break down naturally by microbial action
 - Are chemically stable
 - Do not dissolve in water
8. What is the main environmental issue associated with heavy metals like lead and mercury?
- Air pollution
 - Water contamination
 - Soil erosion
 - Ozone depletion
9. Which of the following is a method of treating hazardous waste?
- Incineration
 - Composting
 - Landfilling
 - Recycling
10. Which of the following gases is most responsible for acid rain formation?
- Carbon dioxide
 - Methane
 - Sulfur dioxide
 - Nitrogen dioxide
11. In which type of environmental analysis is Gas Chromatography (GC) commonly used?
- Water analysis
 - Air analysis
 - Soil analysis
 - Waste analysis
12. Which green chemistry principle emphasizes the use of less hazardous substances?
- Principle 1
 - Principle 2
 - Principle 3
 - Principle 4
13. What does the acronym 'BOD' stand for in environmental chemistry?
- Biological Oxygen Demand
 - Basic Oxygen Demand
 - Bio-organic Density
 - Bacterial Oxygen Density

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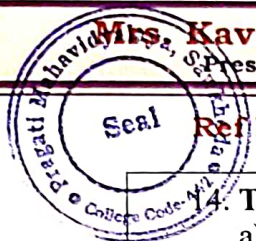
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14. The process of breaking down organic material using microorganisms is known as:
- Incineration
 - Composting
 - Pyrolysis
 - Neutralization
15. Which term describes the concentration of dissolved salts in water?
- COD
 - BOD
 - TDS
 - pH
16. What is the primary aim of environmental monitoring programs?
- To control pollution
 - To measure environmental changes
 - To regulate industrial processes
 - To promote recycling
17. Which of the following pollutants is a primary contributor to smog formation?
- Carbon monoxide
 - Ozone
 - Nitrogen dioxide
 - Particulate matter
18. Which chemical element is a key component of chlorofluorocarbons (CFCs) that contribute to ozone depletion?
- Fluorine
 - Chlorine
 - Bromine
 - Iodine
19. The practice of converting waste materials into reusable materials is known as:
- Landfilling
 - Recycling
 - Incineration
 - Composting
20. Which analytical technique is used to measure the concentration of pollutants in air samples?
- Mass Spectrometry
 - Spectroscopy
 - Chromatography
 - Gravimetry

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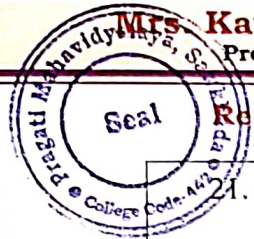
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21. Which type of pollution is most directly associated with vehicular emissions?
 - a) Water pollution
 - b) Soil pollution
 - c) Air pollution
 - d) Noise pollution
22. The primary cause of eutrophication in water bodies is:
 - a) Excessive nitrogen and phosphorus
 - b) High temperature
 - c) Low pH
 - d) Excessive oxygen
23. Which of the following is NOT a method of solid waste disposal?
 - a) Incineration
 - b) Composting
 - c) Landfilling
 - d) Sedimentation
24. Which principle of green chemistry focuses on reducing the environmental impact of chemical processes?
 - a) Principle 5
 - b) Principle 6
 - c) Principle 7
 - d) Principle 8
25. The term 'Toxicity' refers to:
 - a) The amount of pollutants in the environment
 - b) The ability of a substance to cause harm to organisms
 - c) The concentration of nutrients in soil
 - d) The rate of decomposition of organic matter
26. What is the role of activated carbon in water treatment?
 - a) To remove microorganisms
 - b) To remove dissolved chemicals
 - c) To neutralize acidity
 - d) To reduce turbidity
27. Which type of waste is best suited for composting?
 - a) Plastic waste
 - b) Glass waste
 - c) Organic waste
 - d) Electronic waste
28. Which of the following is a key component of the nitrogen cycle?
 - a) Nitrification
 - b) Phosphatization
 - c) Sulfation
 - d) Decomposition

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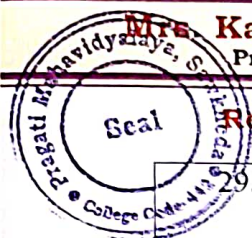
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29. Which chemical property is used to measure the acidity or alkalinity of a solution?

- a) COD
- b) BOD
- c) TDS
- d) pH

30. What is the primary focus of environmental chemistry?

- a) Developing new chemical compounds
- b) Studying chemical processes in living organisms
- c) Understanding chemical processes affecting the environment
- d) Improving industrial chemical production

Answer Key

- 1. d) Oxygen
- 2. b) Vehicle exhaust
- 3. a) Sedimentation
- 4. a) Methane
- 5. b) COD
- 6. d) Sulfur cycle
- 7. b) Break down naturally by microbial action
- 8. b) Water contamination
- 9. a) Incineration
- 10. c) Sulfur dioxide
- 11. b) Air analysis
- 12. b) Principle 2
- 13. a) Biological Oxygen Demand
- 14. b) Composting
- 15. c) TDS
- 16. b) To measure environmental changes
- 17. c) Nitrogen dioxide
- 18. b) Chlorine
- 19. b) Recycling
- 20. a) Mass Spectrometry
- 21. c) Air pollution
- 22. a) Excessive nitrogen and phosphorus
- 23. d) Sedimentation
- 24. a) Principle 5
- 25. b) The ability of a substance to cause harm to organisms
- 26. b) To remove dissolved chemicals
- 27. c) Organic waste
- 28. a) Nitrification
- 29. d) pH
- 30. c) Understanding chemical processes affecting the environment

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