



Ref. No. RGU/CHEM/Circular/2022/008

August 1, 2022

परिपत्र / CIRCULAR

This is to inform that Department of Chemistry will offer the following paper to the students of Semester III as Open Elective Paper in the current academic session

Paper Code : CHEO 543  
Paper Title : **Environmental and Green Chemistry**

All the interested Semester III students are requested to make it convenient to apply in the prescribed format and submit it to the Office of the Department of Chemistry on or before **August 10, 2022**. Provisionally selected list for the course would be declared on **August 12, 2022**.

Classes will commence from **August 16, 2022**.

*Daikei*  
01/08/2022

विभागाध्यक्ष / Head

Department of Chemistry, RGU

विभागाध्यक्ष/Head  
रसायन विज्ञान विभाग  
Department of Chemistry  
Rajiv Gandhi University  
Rono Hills, Doimukh  
Arunachal Pradesh

प्रतिलिपि/ Copy to:

1. All Heads of the Departments for information and necessary action, please
2. Joint Registrar (Acad./Conf.) for information, please
3. Joint Director (Computer Centre) with a request to upload the circular in the university website
4. Departmental Notice board
5. Office Copy

*Daikei*  
01/08/2022

विभागाध्यक्ष / Head

Department of Chemistry, RGU

विभागाध्यक्ष/Head  
रसायन विज्ञान विभाग  
Department of Chemistry  
Rajiv Gandhi University  
Rono Hills, Doimukh  
Arunachal Pradesh

## SEMESTER III

### CHEO 543 OPEN ELECTIVE: Environmental and Green Chemistry

#### 4 Credit 40 Contact Hours

Total Marks: 100 (Internal 20 + End Semester Exam 80)

#### UNIT I: Atmospheric Chemistry

Temperature and pressure variation in the atmosphere, role of free radicals in atmospheric chemistry. Catalytic processes of ozone destruction, formation of Antarctic and Arctic ozone holes. Chemistry of smog formation, VOCs and their oxidation. Acid rain. PAHs and heavy metals in aerosols, lifetime and transport of aerosol particle. Global warming and greenhouse effect, Sources of Indoor air pollution

#### UNIT II: Water and Soil Pollution

Sources of water pollution: agricultural and pesticidal pollutants, industrial and domestic effluent. Marine pollution, oil spills and oil pollution. Community wastewater treatment chemistry, biological process for removal of phosphorus and nitrogen from wastewater sources. Soil formation: Physical and Chemical weathering, Soil properties: Soil Texture, Cation exchange capacity, Causes of soil pollution, Chemistry and management of municipal and biomedical waste.

#### UNIT III: Environmental Toxicology and Detoxification Mechanism

Organic biocides, chemical stability, photolytic and non-photolytic reactions, hydrolysis, oxidation and reduction reactions, rates of degradative reactions, mobility of biocides. Principles of toxicology, chemical solution to environmental problems, better biodegradability. Kinetics of decomposition, solid remediation, chemical remediation and bioremediation.

#### UNIT IV: Principles of Green Chemistry

Principles of green chemistry, use of green starting materials and renewable feedstock, green solvents, green catalyst, less hazardous products, design for energy efficiency, design for degradation and real time analysis for pollution prevention.

#### Recommended Books

1. Vanloon G. W.; Duffey S. J., *Environmental Chemistry*, 3rd Ed., Oxford University Press, New Delhi (2011).
2. Anastas, P. T.; Warner, J. C., *Green Chemistry: Theory and Practice*, Oxford University Press, New Delhi (2008).

#### Further Reading

1. Clark, J. H.; McQuarrie, D., *Handbook of Green Chemistry and Technology*, Blackwell Publishing, Oxford (2002).
2. Pani, B., *A Textbook of Environmental Chemistry*, IK International Publishing House, New Delhi (2007).
3. Ahluwalia, V. K.; Kidwai M., *New Trends in Green Chemistry*, Anamaya Publishers, New Delhi (2006).



## RAJIV GANDHI UNIVERSITY

Rono Hills, Doimukh 791 112  
Arunachal Pradesh, India

### Application Form for Registration for Open Elective Courses

1. Name of the Student: .....
2. Name of the Department/Institute: .....
3. Dept. Roll No.: ..... Semester .....
4. RGU Registration Number: .....
5. Department / Institute offering Open Elective Course: .....
6. Open Elective Course with Code: .....

Signature of the Student

Signature of Student Advisor

Signature of Head of the Department with seal

Accepted / Not Accepted

Signature of Head of the Department / Institute (with Seal)  
offering the Open Elective Course

---

Copy 1: to be submitted to Head, Parent Department  
Copy 2: to Department where student is applying for Open Elective Course