रसायन विज्ञान विभाग
Department of Chemistry

राजीव गांधी विश्वविद्यालय
रोनो हिल्स, दोईमुख ७९१ ११२, अरुणाचल प्रदेश
Rajiv Gandhi University
Rono Hills, Doimukh 791 112, Arunachal Pradesh

Ref. No. RGU/CHEM/Notice/2024/013

August 5, 2024

सूचना / NOTICE

This is to notify that the Department of Chemistry will offer the following paper to the students of 3rd Semester as an Open Elective Paper in the current academic session

Paper Code : **CHEO 541**
Paper Title : **Environmental and Green Chemistry**

All interested 3rd Semester 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 9, 2024**. The provisionally selected list for the course will be declared on **August 12, 2024**.

Classes will commence on **August 14, 2022**.

05.08.2024
(राजेश चक्रवर्ती/ Rajesh Chakrabarty)
विभागाध्यक्ष / Head
Department of Chemistry, RGU

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Department of Chemistry
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Arunachal Pradesh

प्रतिलिपि/ Copy to:

1. All Heads/Directors of the Department/Institute for information and wide circulation, please.
2. The 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.

दूरभाष : +९१ ३६० २२७८५७३(कार्यालय); फैक्स : +९१ ३६० २२७७८८९; ईमेल : hod.chemistry@rgu.ac.in
Phone: +91 360 2278573; Fax: +91 360 2277889; Email: hod.chemistry@rgu.ac.in

Annexure II

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

SEMESTER III

CHEO 541 OPEN ELECTIVE: Environmental and Green Chemistry

Contact Hours per week: 4
Credits: 4
Terminal Examination Duration: 3 Hours
Maximum Marks: **100** (Terminal – 80, Sessional – 20)

Course objective: This course on environmental and green chemistry will educate the students about the concerns, remediation and perspective about environment and the global concerns. Students are expected to understand different aspects of environmental chemistry, chemistry of atmosphere, soil and water and fundamental aspects of green chemistry.

Learning Outcome: Students will be able to demonstrate an understanding of environmental chemistry, viz. air, water and soil pollution and their relationships vis-a-vis environment. Students will also learn green and sustainable methods developed in chemistry.

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, Climate change Protocols. 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: A Global Perspective*, 4th Ed., Oxford University Press, Oxford (2017).
2. Anastas, P. T.; Warner, J. C., *Green Chemistry: Theory and Practice*, Oxford University Press, Oxford (2005).

Further Reading

1. Clark, J. H.; McQuarrie, D., *Handbook of Green Chemistry and Technology*, Wiley-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*, Springer Inida, New Delhi (2012).
4. Biswas, T. D.; Mukherjee, S. K. *Text Book of Soil Science*, Tata McGraw Hill India, New Delhi (2017).