राष्ट्रीय प्रौद्योगिकी संस्थान रायपुर
NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR
(Institute of National Importance)
G.E. Road, Raipur – 492010 (CG)
Phone: (0771) 225 42 00
Fax: (0771) 225 46 00
Email: directornitrr@rediffmail.com
Website: www.nitrr.ac.in

DEPARTMENT OF CHEMISTRY

SYLLABUS – Environment & Ecology

Name of Subject	Environment & Ecology	Subject Code	0020212(CH)
Semester	1st and 2nd	Board of Studies	Chemistry
Maximum Marks	**70**	Minimum Marks	**25**
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/week	Credits
3	1	-	4

First Sem.: Mechanical, Metallurgy, Civil, Mining, Computer Science
Second Sem.: Electronics, Electrical, Bio-Technology/Bio-Medical, Chemical, Information Technology

UNIT I -Fundamentals of Environment & Ecology

Environment definition, Environmental Segments, Concepts of Ecosystem: Fundamentals of Ecology and Ecosystem, Components of ecosystem, Food chain, Food web, Trophic level, Energy flow. Introduction, types, characteristic features, structure and function of the following ecosystem: Forest, Grassland, Desert and Aquatic ecosystem. Effects of human activities on environment: Agriculture, Housing, Industry, Mining and Transportation activities, Basics of Environmental Impact Assessment & Sustainable Development.

UNIT II - Natural Resources

Water Resources - Availability and Quality aspects. Mineral Resources, Soil, Material cycles- Carbon, Nitrogen and Sulphur Cycles. Energy - Different types of energy, Conventional and Non-Conventional sources - Hydro Electric, Fossil Fuel based, Nuclear, Solar, Biomass and Geothermal energy and Bio-gas. Gas Hydrates, Hydrogen as an alternative future source of Energy.

UNIT III - Environmental Pollution & Current Environmental Issues of Importance

Definition causes effects and control measures of:
Air Pollution, Water pollution, Land pollution, Noise pollution.

Climate Change and Global warming: Effects, Acid Rain, Ozone Layer depletion, Photochemical Smog, Solid waste management, Waste water treatment.

UNIT IV - Environment Quality Standards

Ambient air quality standards, Water quality parameters and standards; Turbidity, pH, Suspended solids, hardness, residual chlorine, sulfates, phosphates, iron and manganese, DO, BOD, COD.

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UNIT V - Instrumental Methods for monitoring Pollutants

Modern techniques used in analysis, Conductometric analyzer, Atomic Absorption Spectroscopy, Nephelometry & Turbidimetry, Determination of disinfectants, Determination of pesticides, Microbial methods of estimation.

Text Books

1. Environmental Chemistry by B.K. Sharma & H. Kaur, Goel Publishing House.
2. Environmental Chemistry by A. K De, New Age International Publishers.

Reference Books

1. Instrumental method of Analysis by B.K. Sharma, Goel Publishing House.
2. A Test Book of Environmental Chemistry & Pollution Control by S. S. Dara, S. Chand and Co.
3. Environmental Chemistry by Samir K. Banerjee, Prentice Hall of India Pvt. Ltd. New Delhi.