राष्ट्रीय प्रौद्योगिकी संस्थान रायपुर
NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR
(Institute of National Importance)
G.E. Road, Raipur – 492010 (C G)
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DEPARTMENT OF CHEMISTRY
TEMPLATE FOR PROPOSING SYLLABUS
B. TECH. I & II SEMESTER

1.	Department proposing the course	Chemistry
2.	Course Title	Environment and Ecology
3.	L-T-P Structure	3-0-0
4.	Credits	3
5.	Course number (Code)	0020212(CH)
6.	Status (Core/Elective)	Core
7.	Pre-requisites (course no./title)	NA
8.	Frequency of offering	Odd and Even both semester
9.	**Course Objectives (CO): At the end of this course learner will be able to** 1. Aware of knowledge about Environment, Ecology, natural resources, environmental pollution and control measures, and Instrumental techniques for monitoring of pollutants for the service of mankind. 2. Learn about environmental impacts of all scientific and technology based activities. 3. Develop environment benign technology for the welfare of the Society and Nation. 4. Apply the knowledge of environmental science to improve the existing technology in daily life and research.	
10.	**Course Syllabus:** **UNIT I - Fundamentals of Environment & Ecology (10hrs)** Definition, Components of Environment, Environmental Degradation, Fundamentals of Ecology and Ecosystem, Components and Classification of Ecosystem, Energy flow in Ecosystem: Tropic level, Food Chain, Food Web, Ecological Pyramid, Environment Impact Assessment & Sustainable Development. **UNIT II - Natural Resources (10hrs)** Material cycles- Carbon, Nitrogen, Sulphur, Phosphorus and Water Cycles. Mineral Resources, Energy Resources, Conventional and Non-Conventional: Coal, Petroleum, Natural Gas, Nuclear Fuel, Hydro- Electric, Solar, Biomass, Wind, Tidal, Geothermal, and Hydrogen as alternative future source of Energy. **UNIT III - Environmental Pollution and its Control (10hrs)** Air Pollution and control measures, Water Pollution, Land Pollution, Noise Pollution. Global warming, Acid Rain, Ozone-Layer Depletion, Photochemical Smog, Waste water treatment, Solid waste management. **UNIT IV – Environment Quality Standards and Instrumental Techniques for monitoring of Pollutants (10hrs)** Ambient air quality standards, Water quality parameter and standards: pH, Turbidity,	

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	Hardness, Sulphate, Phosphates, Iron, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand. **Instrumental Techniques:** UV-Visible Spectroscopy, Atomic Absorption Spectroscopy, Nephelometry and Turbidimetry.
11	**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. 3. Environmental Chemistry and Pollution By S. S. Dara & D. D. Mishra , S. Chand Publishing.
12	**Reference Books:** 1. Instrumental method of Analysis by B.K. Sharma, Goel Publishing House. 2. Environmental Chemistry by Samir K. Banerjee, Prentice-Hall of India Pvt. Ltd. New Delhi.

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DEPARTMENT OF CHEMISTRY
TEMPLATE FOR PROPOSING SYLLABUS
B. TECH. I & II SEMESTER

1.	Department proposing the course	Chemistry
2.	Course Title	Environment and Ecology Laboratory
3.	L-T-P Structure	0-0-2
4.	Credits	1
5.	Course number (Code)	0020222(CH)
6.	Status (Core/Elective)	Core
7.	Pre-requisites (course no./title)	NA
8.	Frequency of offering	Odd and Even both semester
9.	**Course Objectives (CO): At the end of this course learner will be able to** 1. Draw the attention about the challenges related to sustainability of life on earth. 2. Find out concentration of ingredients present in air, water and soil samples. 3. Educate the environmental quality standards and their permissible limit in different samples by using various analytical instruments. 4. Design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.	
10.	**Course Syllabus:** **List of Experiments:** Experiment 1 Determination of free CO_2 in a given water sample. Experiment 2 Determination of acidity of given sample of water. Experiment 3 Determination of free residual chlorine present in given water sample. Experiment 4 Determination of hardness of water sample. Experiment 5 Determination of Dissolved Oxygen present in given water sample. Experiment 6 Determination of Chemical Oxygen Demand in waste water sample. Experiment 7 Measurement of pH of the given water sample. Experiment 8 Determination of sulphate in the given water sample. Experiment 9 Determination of sodium and potassium in the given water sample by Flame Photometer. Experiment 10 Measurement of Turbidity of given water sample by Nephelo-Turbidity Meter.	

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11	**Text Books:** 1. A textbook on Experiments and Calculations in Engineering Chemistry by S. S. Dara, S. Chand Publications, New Delhi.
12	**Reference Books:** 1. Vogel's Textbook of Quantitative Chemical Analysis (Latest ed.), Revised by G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney.