

**Second year of Five Years integrated M. Sc. (Physics)****M.Sc-II, Semester – III****MS 207 BASIC SCIENCE ELECTIVE (BSE) Chemistry of Environment**

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- **INTRODUCTION:** (02 Hours)  
Environmental Science-objectives and guiding principles, Troposphere hydrosphere, atmosphere and lithosphere, Environmental chemistry and its scope.
- **TYPES OF POLLUTION AND POLLUTANTS:** (06 Hours)  
Air pollution and pollutants and their limits, Long distance movements of Pollutants and their control and monitoring, Water pollution and pollutants and their effects, Soil pollution and pollutants and their effects.
- **AIR POLLUTION:** (09 Hours)  
Air Pollutants CO, CO<sub>2</sub>, Cl<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, H<sub>2</sub>S, Ozone, CH<sub>4</sub> and H<sub>2</sub>O and their sources, Atmospheric photochemistry, effect of NO<sub>x</sub>, and CFCs on Ozone layer, Particulates and their sources, toxic effect of particulates, Smog, Photochemical smog & mechanism of its formation, acid rain, green house effect, global warming.
- **WATER POLLUTION:** (09 Hours)  
Aerobic and anaerobic oxidation, BOD, COD, Sewage and other oxygen demanding waste, Plant nutrients, fertilizers, Exotic organic chemicals, inorganic material and chemical compounds, Pollution due to surfactants and oil spills, Treatment of domestic waste water, Industrial waste water and treatments.
- **SOIL POLLUTION:** (09 Hours)  
Haloorganics and Pesticides, Insecticides, Fungicides, Herbicides and their chemical analysis, biodegradation of pesticides, effect of pesticides on environment, alternative method of pest control. Autocide technique, use of sex-attractants, use of juvenile hormones and its causes.
- **THERMAL POLLUTION:** (04 Hours)  
Introduction, sources- nuclear, coal fired, hydroelectric power plants, Industrial effluents and domestic sewage, effects and control of thermal pollution.
- **NOISE POLLUTION:** (02 Hours)  
Characteristics of sound, sources- industrial, transport and neighbourhood, effect of noise pollution, measurement of noise. control of noise pollution.
- **GREEN CHEMISTRY:** 12 Principles (01 Hours)

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(Total Contact Time (Theory): 42 Hours)

**BOOKS RECOMMENDED:**

1. **Puri B K, Sharma L R and Falia K C**, *Principles of inorganic chemistry*, Shobanlal Nagin Chand & Co., Jalandhar, 1998.
2. **Chawla Shashi**, *A text book of engineering chemistry*, 3<sup>rd</sup> Edn, Dhanpat Rai & Co (P) Ltd, Delhi, 2003.
3. **Sharma B. K.**, *Engineering Chemistry*, 3<sup>rd</sup> Edn, Krishna Prakashan Media, 2001.
4. **Bailey R. A., Clark H. M., Krause S and Strong R. L.**, *Chemistry of the environment*, 2<sup>nd</sup> Edn, Academic Press- An Imprint of Elsevier, 2002.
5. **Wright R. T.** *Environmental Science*, 9<sup>th</sup> Edn, Prentice-Hall of India, New Delhi, 2005.