NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY

NEW DELHI -110078

DEPARTMENT OFCHEMISTRY

Course No.	Title of the Course	Course Structure	Pre-Requisite
FCCH008	Environmental Sciences and Green Chemistry	3L-0T-2P	None

COURSE CONTENT:

UNIT I FUNDAMENTAL CHEMISTRY

Periodic table and periodic properties of elements (ionization potential, electron affinity and electronegativity); mole concept, molarity and normality, quantitative volumetric analysis; Chemical Bonding (ionic, covalent, coordinate and hydrogen bonds); Redox reactions ; concepts of pH and pE; Electrochemistry (Transport No. & Electrodes); Catalysis; Reaction Mechanisms (electronic effects).

UNIT II ENVIRONMENTAL POLLUTION & CHEMISTRY

Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards; Solid waste Management: Causes, effects and control measures of urban an industrial wastes; Role of an individual in prevention of pollution;

UNIT III SPECTROMETRIC AND THERMOGRAVIMETRIC METHODS

Thermal Method of Analysis: Elementary discussions of TGA, DTA & DSC. Infrared, Ultra-Violet and Visible spectrophotometer, NMR and their applications.

UNIT IV WATER CHEMISTRY

Unique Properties of Water, Water Quality Parameters: physico-chemical, biological and Bacteriological parameters, Water Quality Criteria and Standards, Water Pollution: Heavy Metal Pollution and its Abatement Methods of Water and Wastewater Treatment, Application of nano sciences in water treatment.

UNIT V GREEN CHEMISTRY

Green Chemistry and Green Technology: New trends in Green chemistry; Green Chemistry Methodologies-Microwave heating & pollution, ultrasound technique, Quantitative/Optimization Based Frameworks for the Design of Green Chemical Synthesis Pathways; Green reagents, green solvents; Soil microorganisms and their functions Atom economy concept and its environmental importance.

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Manahan, S. E. (2010). Water chemistry: green science and technology of nature's most renewable resource, CRC Press, USA. Green Chemistry: Theory & Practice/P.T. Anastas & J.C. Warner/ Oxford Univ Press
Engineering Chemistry By Jain & Jain
Green Chemistry: Green Chemistry: V.K.Ahluwalia
Introduction to Thermal Analysis By Michael E. Brown/ Springer Netherlands
Chemistry in Engineering and Technology Vol. 1 & 2 by Kuriacose & Raja Ram, Tata McGraw Hill & Co. Applications of absorption spectroscopy of organic compounds by John Robert Dyer, Prentice-Hall *Textbook of Environmental Chemistry by Dr. Balram Pani.*
Practical Chemistry, By Pandey, Bajpai & Giri
Practical I Green Chemistry By V.K. Ahluwalia