Revised on 05.09.2019

B. Tech. IInd Semester

Engineering Chemistry & Environmental Sciences- AS 203

CO 1- To develop an understanding of water, its quality, properties and treatment in industries.

CO 2- To study and understand about various fuels and renewable & non renewable sources of energy.

CO 3- To understand the chemistry of corrosion, its types and protection from it.

CO 4- To study and understand about the basics of environment and pollution.

CO 5- To develop knowledge and understanding of biotechnology.

ENGINEERING CHEMISTRY & ENVIRONMENTAL SCIENCE – II (AS – 203)

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UNIT – 1: WATER TREATMENT (Lectures- 8)

Water Quality Parameters (BIS & WHO Standards), types of hardness, Units, Determination of hardness by EDTA method, Alkalinity of water & its significance, Numerical problems, Problems with boiler feed water and its treatment; Scale & Sludge formation, Boiler corrosion, Caustic Embrittlement, Priming & foaming, Softening methods; Lime-soda, Zeolite & Ion Exchange processes, Numerical problems, Chlorination of water, Coagulation, Sedimentation and Desalination.

UNIT – 2: ENERGY RESOURCES (Lectures- 8)

Types of fuels, Calorific values, HCV & LCV and its determinations by Bomb and Boys gas calorimeter, Numerical problems, Coal; Types of coal, Analysis of coal, Liquid Fuel; Refining of petroleum, Knocking, Octane and Cetane Values, Pollution from fossil fuels, Combustion and Problems. Renewable; (Solar Cells, Rechargeable Batteries, Fuel Cells) and Non-renewable Sources of energy; (Wind Energy, Geothermal Energy, Ocean Energy), Resources.

UNIT – 3: CORROSION AND ITS PROTECTION (Lectures- 7)

Corrosion; Definition and its scope, Chemical Corrosion, Electrochemical Corrosion, Mechanism of Chemical and Electrochemical Corrosion, Types of Corrosion; Intergranular Corrosion, Soil Corrosion, Waterline Corrosion, Differential Aeration Corrosion, Galvanic and Concentration Cell Corrosion, Factors affecting corrosion, Protection of corrosion.

UNIT – 4: ENVIRONMENTAL CHEMISTRY (Lectures- 8)

Environment and its Segments, Zones of Atmosphere, Air Pollution: Air pollutants and their resources; Aerosol and its Types, RSPM, SPM, Acid rain, Green House Effect, Global warming, Ozone Layer Depletion, Water Pollution; Sources of water pollution, Sewage Treatment, Determination and Significance of COD, BOD, TOC, Noise Pollution, Soil Pollution, Radioactive Pollution and e-Waste.

UNIT – 5: ENVIRONMENTAL BIOTECHNOLOGY (Lectures- 7)

Biotechnology and its applications, Fermentation, Production of alcohol and vitamins, Biotechnology for environmental Protection, Biological indicators, Biosensors, Bioremediation, Phytoremediation, Bio-pesticides, Bio-fertilizers, Bioreactors, Social issues, Biodiversity and its conservation.