CHE7E504 Chemistry and Environment OE Credits 4
https://forms.gle/uf8o29L17aJhWuv39
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UNIT 1: Environmental Segments (12 h)
Atmosphere Composition, structure, evolution, particles, ions, and radicals in the atmosphere. Chemical and photochemical reactions in the atmosphere: oxygen and ozone chemistry. Greenhouse effect. Human activities and meteorology. Hydrosphere Water resources and water cycle, physico-chemical characteristics of aquatic environment.
Microorganisms The catalysts of aquatic chemical reactions. Eutrophication. Sewage treatment. Lithosphere Compositions, inorganic and organic components in soil. Micro and macro nutrients. Nitrogen pathways and NPK in soil. Biosphere - Composition of Biosphere & brief account of types of biomes.

UNIT 2: Air Pollution (12 h)
Sources of air pollution. Sources, sinks, and control of CO , NOx, and SOx pollution. Acid rain. Hydrocarbons and photochemical smog. Particulate and its effects on humans. Sources of particulates. Inorganic and particulate matter and chemical processes for their formation. Fly ash. Organic particulate matter. Effects of particulates on materials. Particulates and climate.
Control of particulate emissions. Radioactivity: Natural sources and man-made sources. Effects of atmospheric pollution. Corrosion of metals. Analysis of NOx, SOx, H2S, hydrocarbons, (exhaust, petrol, and air), and particulate matter.

UNIT 3: Water Pollution (12 h)
Sources of water pollution. Trace elements in water. Chemical specifications. Water quality parameters, standards, ad monitoring techniques: ammonia, nitrate, nitrite, chloride, fluoride, cyanide, sulphide, sulphite, phosphate, calcium, magnesium, boron, silica, arsenic, selenium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, silver, zinc, phenols, pesticides, surfactants, tannin and lignin, and E.coli.

UNIT 4: Chemical Toxicology (12 h)
Toxic chemicals in the environment. Impact of toxic chemicals on enzymes. Biochemical effect of arsenic, cadmium, lead, mecury, carbon monoxide, nitrogen oxides, sulphur dioxide, ozone and PAN, Cyanide, and pesticide. Carcinogen.

UNIT 5: Instrumental Techniques in Environmental Chemical Analysis (12 h)
Neutron activation analysis, anode stripping voltammetry, atomic absorption spectroscopy (AAS), Inductively coupled plasma emission spectroscopy (ICPES), X-ray fluorescence, nondispersive infrared spectrometry, Fourier transform infrared spectroscopy, chemiluminescence, gas chromatography, high performance liquid chromatography, ion selective electrodes, ion chromatography.