**EV20001, Spring 2020**

**Major Topics Covered**

Definition of Environment and Pollution, A few cases of air and water pollution, Soil Pollution, Love Canal Episode, Major water, air and soil pollutants, 42nd Amendment of the Indian Constitution, Three laws of environmental protection in India and their scope (Water Act, Air Act, Env Protection Act), More important pollution control rules in India and their scope (Solid waste management Rule. E-Waste management rules, Plastic waste management Rules, Biomedical waste management rules, Noise rules), Extended Producer Responsibility, Polluter pays principle and a few examples of its application, National Environment Policy, Poverty and Environmental quality, Environmental Kuznets Curve, Environmental Performance Index (EPI) and the parameters used for its calculation, India’s rank in relation to EPI

Major sources of surface and ground water pollution, Point and non-point sources, examples, Water Quality Parameters – BOD, COD, TDS, Color and Odor, Turbidity, Persistent Organic Pollutants (POP’s), examples and their fate in the environment, bioaccumulation and effects on the living species, Eutrophication and its effects, BOD and COD standards, Govt Initiatives of cleaning the river Ganga – GAP 1 and 2, NMCG, and other initiatives.

Global and Indian Wastewater Scenario, Generation and Treatment status, Steps of treatment of municipal wastewater – primary and secondary treatment, activated sludge techniques, aerated tank and trickling filter, BOD removal rate constant and related calculations, Phases of growth of pure culture in wastewater treatment, Monod equation, Calculations on aerated tank volume and sludge generation, Hydraulic and Cell retention times, MLSS and MLVSS, tertiary treatment, Sludge stabilization and utilization, Recycling of treated water.

Sustainable Development and the origin of the concept, its definition, Key points of the Brundtland Commission report, Earth Summits (1992, 2002 1nd 2012) and the emphasis placed on sustainable development, Millennium Development Goals (MDG’s) and Sustainable Development Goals (SDG’s), Three pillars of sustainability, The concept of Green Economy and Circular Economy, Circular Economy, waste management and resource recovery, Cradle-to-Grave and Cradle-to-Cradle concepts. Green house gas emission and Global warming, The effects of and international initiatives on tackling global warming and climate change, Conference of Parties (COP’s), major targets on limiting global warming, CO2 sequestration and storage technologies, National Initiatives n climate change