

## SYLLABUS

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**UNIT-1****WATER POLLUTION**

Sources, Types and Effects of Water pollutants – Oxygen Demanding Wastes -Measurement of pollution loads: DO, BOD, COD, TOC - Water quality standards -Effluent discharge standards

**WATERPOLLUTION CONTROL - PHYSICAL METHODS**

Pre treatment processes: Screening - Comminuting – Grit removal – Sedimentation – Design of Sedimentation tank - Flootation

**UNIT-2****WATERPOLLUTION CONTROL - BIOLOGICALMETHODS**

Decomposition of Organic Waste - Role of Microorganisms - Bacterial population dynamics- growth kinetics

Biological Treatment Systems - Activated Sludge Process – Trickling Filters – Bio Towers- Rotating Biological Contactors – Secondary clarification- Sludge treatment

Low Cost Treatment Systems: Stabilization ponds - Aerated Lagoons

Advanced Treatment Systems: Nitrogen removal - Phosphorous removal – Ion exchange – Reverse Osmosis- Chemical Oxidation

**UNIT-3****AIR POLLUTION**

Sources, Types, Effects and Fate of air pollutants - Atmospheric stability - Effect of Wind - Plume behavior - Dispersion of Air Pollutants - Estimation of plume rise -Sampling and Measurements of Air pollutants - Air Quality Standards

**AIR POLLUTION CONTROL METHODS FOR PARTICULATES**

Particulate Emission Control equipment- Mechanism, collection efficiency and design aspects of : Gravitational Settling Chambers - Cyclone Separators - Fabric Filters - Electrostatic Precipitators - Wet scrubbers

**UNIT-4****AIR POLLUTION CONTROL METHODS FOR GASES**

Control of Gaseous Emissions- Absorption by liquids - Adsorption by Solids – Catalytic Combustion

Control of Sulphur Dioxide Emission - Control of Nitrogen Oxides - Control of Carbon monoxide - Control of Hydrocarbons

**UNIT-5****SOLID WASTE DISPOSAL METHODS**

Sources, Types of Solid wastes – Disposal methods: Land filling - Composting - Incineration – Pyrolysis – Refuse derived Fuels – Bio medical wastes- Nuclear Wastes & E- wastes

**SOIL POLLUTION CONTROL METHODS**

Reclamation of polluted and degraded soil by Bioremediation- Phyto-remediation

**NOISE POLLUTION CONTROL METHODS**

Human acoustics, Sound and its general features - Noise and its measurement - Noise pollution hazards - Control methods

**Text Books**

1. C.S.Rao (2006), Environmental Pollution Control Engineering, New Age International (P) Limited Publishers, New Delhi.
2. Howard S. Peavy, Donald R. Rowe and George Tchobanoglous (1985), Environmental Engineering, Mc Graw-Hill International Editions, New York.

**Reference Books**

1. S.K. Garg,(2010),Sewage Disposal And Air pollution Engineering, Khanna publishers, New Delhi
2. M.N Rao and A.K Dutta,(2000) Waste water Engineering, Oxford & IBH Publishing Co.Ltd.
3. M.N Rao and H.V.N Rao,(2000), Air Pollution, Tata McGraw- Hill Publishing Company Limited, New Delhi
4. Davis Cornvel,(2000),Environmental Engineering, McGraw Hill Book Co., New York
5. Met Calf &Eddy(2006), Waste Water Engineering, McGraw Hill Book Co., New York