

# **Curriculum for Entry Test**

## **MSc & PhD Environmental Engineering**

The tentative curriculum for the MSc environmental engineering entry test includes, but not limited to the following areas and topics of environmental engineering.

### **1 Air pollution**

Indoor and outdoor pollutants and their sources, Effect of air pollution on human health and environment, Air quality regulations, air pollution index, national standards for ambient air quality, vehicular and industrial emissions, Basic meteorological processes, Regional and global environmental issues (Ozone depletion, acid rain), Climate change, Causes and role of air pollution in climate change, Air pollution control devices, Carbon capture and storage, Source, effects and control of radioactive and noise pollution and other related topics.

### **2 Solid Waste Management**

Sources and types of solid waste, Generation of solid waste, on site storage of solid waste, collection of solid waste, Types of collection systems and vehicles, Transfer and transport of solid waste, Processing of solid waste (mechanical size reduction, mechanical volume reduction, chemical volume reduction, component separation, dewatering and drying), Disposal of solid waste (Composting, Incineration, Land fill), Recycling, Waste to energy techniques and other related topics.

### **3 Water Supply and Wastewater Engineering**

Water consumption, factors effecting and variation in water consumption, Design period and population projection for water demand, Component of water supply system, Design of water distribution system using EPA net, Drinking water quality and human health, water quality guidelines and standards, WHO guidelines for drinking water quality and other related topics.

Wastewater Engineering, Design of Wastewater collection system, pumping stations and wastewater treatment, health and risk problems associated with faulty design and configuration of water supply and sewage network, Basic concepts of plumbing design in multistoried

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buildings and other related topics.

### **4 Water and Wastewater Treatment Plant Design**

Water treatment plant design, rationale for water treatment, Typical treatment of surface waters, Design criteria and design of coagulation, flocculation, sedimentation, filtration and disinfection facilities, advanced water treatment technologies including membrane technologies and other related topics.

Wastewater flow measurement and characterization, Types of wastewater treatment, Design of preliminary, primary and secondary treatment of wastewater, Design of sludge treatment and handling facilities, Advanced treatment of wastewater, Site selection for wastewater treatment plant, hydraulic design and hydraulic profile of wastewater treatment plant, Household level wastewater treatment and other related topics.

### **5 Environmental Impact Assessment**

Initial environmental examination (IEE), Environmental impact assessment (EIA) process, Screening and scoping techniques, baseline data collection, impact identification and analysis methods and techniques, Remedial measures, Environmental management plan, public consultation in EIA, Analysis of alternatives, Land acquisition and Rehabilitation plan, Key documents required for submission of EIA report, Guidelines for the preparation of IEE/EIA reports and other related topics.

### **6 Environmental Engineering Lab Techniques**

Standard solution preparation, calibration of instruments, quality control checks, Sample collection and preservation, Determination and environmental significance of water and wastewater quality parameters, Introduction and principles of instrumental techniques including Infrared (IR), UV-Visible spectrophotometer, High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), Atomic Absorption Spectroscopy (AAS), Mass Spectroscopy (MS) and other related topics.