

# AMEV-20 ENVIRONMENTAL INSTRUMENTATION

## OBJECTIVES:

To introduce the principles and application of different instruments used for performance monitoring and testing of equipment in wastewater treatment, air pollution control, effluent analysis and emission monitoring.

## UNIT I GENERAL

machinery, electric motors types and characteristics, prime covers, pumps, Study of other capacity, operation and maintenance of pumping machinery, air compressors preventive maintenance, break-down maintenance, schedules - Factors to be considered in the selection of the equipments.

## UNIT II INSTRUMENTATION

pH meter - Flame Emission Spectrometry. Absorption spectrometry - Nephelometry - Atomic Absorption Spectrometry - Gas chromatography - working principle and components. Total carbon analyser - Mercury Analyser polar graph for metal estimation and organic compounds - Ion selective Electrode - SO<sub>2</sub> and CO analyser - Instrument components and its working principle.

## UNIT III WATER SUPPLY MACHINERY AND WASTEWATER MACHINERY

Drilling equipment, pumping equipment for wells. Machinery required for primary and secondary treatment, sewage pumps, sludge pumps, vacuum filtration equipment.

## UNIT IV EQUIPMENTS FOR TREATMENT UNITS

Equipment for treatment unit - electrically and mechanically operated agitators, mixers, aerators, chlorinators, Surface aerators. Meters for measurement of flow, head, electricity.

## UNIT V AIR POLLUTION CONTROL EQUIPMENTS

Working principles of electrostatic precipitator - cyclone separators - settling chamber - operation and Maintenance. Machinery for solid waste collection and disposal incineration - compactors - magnetic separators- incinerators.

## OUTCOMES:

The students completing the course will have

an understanding of various instruments and equipments used in measurement and monitoring for environmental engineering applications  
ability to describe the operation of a range of sensors and transducers with particular reference to monitoring of water and air quality

## TEXT BOOKS:

Trivedy R. K. & Goel P.K., Chemical and Biological methods for water pollution studies, Environmental publication, Karat, 1-86.  
Cox C.R., Operation and Control of Water Treatment Processes, World Health Organisation, Geneva, 1-64.

**REFERENCES**

Course Manual on Preventive Maintenance of Water Distribution System, NEERI, 1-73.

Standards Methods for the Examination of Water and Waste Water, 17<sup>th</sup> Edition, WPCF, APHA and AWWA, USA, 1-8-.