

## Environmental & Industrial Microbiomes — Hands-on

Learn how to design and analyse microbiome studies in environmental and industrial settings. This module covers study design and sampling for soil, water, marine and engineered systems, metagenomics workflows for environmental matrices, and analytics that support bioremediation, bioprocess monitoring, biofouling control and One Health surveillance.

# Environmental & Industrial Microbiomes

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### Session 1

**Fee: Rs 8800** Apply Now

## Environmental & Industrial Microbiome Landscapes

Overview of environmental and engineered microbiomes

**soil and rhizosphere communities** | **freshwater, marine and coastal microbiomes** | **wastewater, reactors and industrial systems**

Use cases in environment and industry

**bioremediation and contaminant monitoring** | **biogas, fermentation and yield optimisation** | **biofouling, corrosion and process stability**

Study design and sampling principles

**spatial and temporal replication** **composite vs grab samples** **field metadata and environmental parameters**

### **Session 2**

**Fee: Rs 11800** Apply Now

## **Pipelines for Environmental Metagenomes & eDNA**

Sample processing and extraction (concept level)

**soil, sediment and biofilm challenges** **filters for water and wastewater** **eDNA for biodiversity and surveillance**

Metagenomic preprocessing for environmental reads

**quality control and contaminant checks** **host and non target read removal ideas** **co assembly vs sample level assembly thinking**

Taxonomic and functional profiling in environmental data

**marker gene vs whole metagenome profiling** **pathway and trait based summaries** **linking profiles to environmental gradients**

### **Session 3**

**Fee: Rs 14800** Apply Now

## **Bioremediation, Bioprocess & Surveillance Analytics**

Bioremediation and contaminant degradation use cases

**tracking degraders and functional pathways** **before after and control impact designs** **linking microbiome shifts to chemistry and toxicity**

Industrial bioprocess and fermentation monitoring

**microbial community stability indicators** **yield,**

**productivity and off target signatures** **early warning dashboards for process drifts**

Environmental and wastewater surveillance analytics

**indicator taxa and functional markers** **trend and anomaly detection ideas** **simple reports for regulators and plant teams**

#### **Session 4**

**Fee: Rs 18800** Apply Now

### Mini Capstone: Environmental/Industrial Microbiome Case

Designing a small environmental or industrial case study

**guided theory plus practical**

From raw tables to decision friendly summaries

**site comparison and temporal plots** **key taxa, pathways and indicators** **simple dashboards or figure panels**

Deliverables: figures, tables and short narrative for project stakeholders

**overview plots for environment or plant teams** **summary tables of indicators and trends** **brief report suitable for internal or client presentations**