ENVIRONMENTAL QUALITY MONITORING & ANALYSIS

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PRE-REQUISITES : Basic Mathematics; Physics; Chemistry; Environmental Engineering; Chemical Engineering.

INTENDED AUDIENCE : Interested Learners

INDUSTRIES APPLICABLE TO : Environmental Consulting

COURSE OUTLINE :

The course is directed at measuring, modeling and assessing the parameters of environmental quality for the purpose of environmental risk assessment. The course introduces readers to the concept of environmental fate and transport and the methods to apply them in environmental risk assessment. The course also discusses the monitoring methods in the context of environmental fate and transport.

ABOUT INSTRUCTOR :

Prof. R. Ravikrishna Professor(2018 Current) Indian Institute of Technology Madras Associate Professor (2013-2018) Indian Institute of Technology Madras Assistant Professor (2006-2013) Indian Institute of Technology Madras Research Associate (2000-2006) Louisiana State University, Baton Rouge, USA

COURSE PLAN :

Week 1 : Introduction; Definition of Environment; Link between source/environment/receptor; Exposure; Health effects; Toxicology; Defining the need for fate and transport.

Week 2 : Chemicals of concern; relevant properties for environmental fate and transport; Definition of Equilibrium – partition constants, solubility, vapor pressure, Henry's constant, Koc, Kow etc. Equilibrium partitioning of chemicals between different phases of the environment.

Week 3 : Parameters for environmental water/ air / soil / sediment – screening parameters, priority air pollutants – definitions of PM

Week 4 : Monitoring of environmental parameters – screening parameters – BOD, COD, TOC, TDS; Environmental sampling – definition and synthesis of a monitoring/sampling/analysis method. Quality Assurance and quality control (QA/QC).

Week 5 : Methods for sampling/processing/analysis of organic and inorganic constituents in air/water/soil/sediment.

Week 6 : Introduction to environmental transport – BOX Models and the application to multimedia transport of pollutants

Week 7 : Atmospheric Dispersion – Gaussian Dispersion model

Week 8 : Fundamentals of mass transport – definition of intraphase and inter-phase chemical flux; interphase mass transport, diffusion coefficient and convection mass transfer coefficients.

Week 9: Chemical Exchange between air-water

Week 10 : Chemical Exchange between sediment-water

Week 11 : Chemical exchange between soil-air

Week 12 : Overall transport model and scenarios