Introduction to Physical Principles of Environmental Engineering
環工物理原理概論

Instructor: Tsair-Fuh Lin   Phone: 65836, e-mail: tflin@mail.ncku.edu.tw

Class Time: Mon. 1510-1600, Thu. 1510-1700; 1 hr of discussion (TBD)
Room:  Rm. 47112

Course Schedule

1. Introduction (1/2 week)

2. Kinetics (1 1/2 weeks)
   Chemical Kinetics
   Microbial Kinetics

3. Material Balance (1 week)
   Continuity Equation of Fluid
   Mass Balance

4. Ideal and Nonideal Reactor Models (3 weeks)
   Batch Reactor
   Continuously Flow Stirred Tank Reactor (CFSTR)
   Plug Flow Reactor (PFR)
   CFSTR in series, PFR with Dispersion
   Non-Ideal Reactor Models

Mid-Term 1 (2 hours)

5. Mass Transfer (2 weeks)
   Advection
   Diffusion
   Dispersion
   Analogy among mass, heat and momentum transfer

6. Particle Dynamics (2 weeks)
   Settling
   Filtration
   Brownian Motion

7. Interfacial Equilibrium (1 week)
   Open and Closed Systems
   Equilibrium
   Henry's Law
   Adsorption
   Absorption
   Condensation
Mid-Term 2 (2 hours)

8. Interfacial Transport (4 weeks)
   Mass Transfer
   Stagnant Model
   Two-film Theory
   Examples
   Water Quality Models
   Air Stripping Tower
   Transport in Porous Media

9. Case Study and Parameter Determination (1 Week)
   Mass Balance of Contaminants in Reservoir

Final Exam. (2 hours)

References (books):


Grade:

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