

## CIV 426 – Introduction to Environmental Biotechnology

**Current Catalog Description:** This undergraduate course covers the fundamental concepts of biological processes that are important in natural and engineered environmental systems. The course will incorporate basic fundamental microbiology into a quantifiable engineering context in order to describe, predict and control behavior of environmental biological systems.

**Prerequisite:** CIV 320 or permission of the instructor

**Corequisite:** None

**Textbooks and/or Other Required Material:** Required Texts:  
Environmental biotechnology principles and applications, B.E. Rittmann and P.L. McCarty, 2001, McGraw-Hill Book Company, Boston Mass

**This course is:** Not Required;  
Technical Elective Option

- Topics Covered:**
1. Basics of Microbiology
  2. Stoichiometry & Energetics
  3. Water Characteristics
  4. Microbial Kinetics
  5. Reactor Models
  6. Suspended Growth Processes
  7. Biofilm Kinetics and Processes
  8. Nutrient Cycling
  9. Anaerobic Processes
  10. Emerging Issues

**Course Learning Objectives:**

Characterize the biological processes within both engineered and natural systems
Utilize fundamental stoichiometry, kinetics, and material balances to analyze and quantify microbial processes in natural and engineered systems.
Solve biological process problems related to different reactor models of engineered and natural systems.
Get familiar with the processes for the protection, restoration, and treatment of water quality,
Develop skills on literature review and function effectively as a team member to write a scientific report.

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