ENV 6511: Biological Wastewater Treatment — Summer 2019

Catalog Description: Theory and current research associated with biological treatment processes. Credits: 3.

Prerequisites: None.

Course Objectives: The goal of this course is to present the theoretical principles, design procedures, and current ongoing research for the biochemical operations used in wastewater treatment processes. By the end of this course, students should be able to:

1. Describe the various named biochemical operations in terms of their treatment objectives, biochemical environment, and reactor configuration.
2. Understand the basic stoichiometry and kinetics of the various microbial reactions that form the key for quantitative description of biochemical operations.
3. Use stoichiometry and kinetics in mass balance equations to investigate the performance of biological reactors containing microorganisms growing suspended in the wastewater, and also to reactors in which the microorganisms grow attached to solid surfaces.
4. Obtain a rational basis for the design of biological wastewater treatment operations that incorporates knowledge that has been obtained through practice.
5. Explore the effect of xenobiotic and trace contaminants in wastewater treatment systems.
6. Look to the future and examine how the application of biochemical operations can lead to a more sustainable world.

Topics to be covered:
1. Introduction and Background
2. Fundamentals of Biochemical Operations
3. Modeling Suspended Growth Systems
4. Design and Evaluation of Suspended Growth Systems
5. Activated Sludge Process
6. Biological Nutrient Removal
7. Aerobic Digestion
8. Anaerobic Processes
9. Lagoons
10. Biofilm Reactors Modeling
11. Trickling Filters
12. Rotating Biological Contactors (RBCs)
13. Designing Systems for Sustainability

Instructor: Prof. Jaime Benítez
- Office location: 204 MAEB
- Telephone:
• E-mail address: jaime.benitez@ufl.edu
• Website:
• Office hours: MWF, 10:45 – 11:30 AM

**Meeting times:** MWF, 9:30 – 10:45 AM

**Meeting location:** CSE, Room E107

**Textbook Required:**
- Title: Biological Wastewater Treatment
- Author: C. P. Leslie Grady, et al.
- Publication date and edition: 2011, 3rd Edition

**Exams:** There will be 3 partial exams and no final exam. Exams will be take-home.

**Make-up Exams:** Are only given for medical reasons. The student must contact the instructor before the exam to state that he/she will not be able to attend the exam. The student must also provide medical documentation for missing the exam.

**Attendance:** Students are strongly encouraged, but not required to attend class. Most of the classes will be devoted to the solution of engineering problems relevant to the course.

**Grading:**
- Homework problems: 20%
- Exams: 80%

**Honesty Policy:** All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures. This statement is a reminder to uphold your obligations as a UF student and be honest in all work submitted and exams taken in this course and others.

**Commitment to a safe and inclusive learning environment**
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination.

It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination
or harassment of any kind please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

**Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

**Accommodation for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that she/he must provide to the course instructor when requesting accommodation.

**UF Counseling Services:** Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling and Wellness Center, 3190 Radio Rd, 392-1575.
- Career Resources Center, Reitz Union, 392-1601.

**Software Use:** All faculty, staff, and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties to the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.