PRINCIPLES OF BIOLOGICAL WASTE TREATMENT **DR. LANCE LIN**
CIVIL ENGINEERING 546 **SPRING 2018**

LECTURE DAY/TIME/ROOM	TR/14:00 – 15:15/ESB 249A
OFFICE	ESB 641A
PHONE	(304) 293-9935
EMAIL	lianshin.lin@mail.wvu.edu
OFFICE HOURS	Wed. 9AM-12PM or appointment

REQUIRED TEXT:

- Lecture notes

REFERENCE TEXTS:

- Lema & Suarez (2017) Innovative Wastewater Treatment & Resource Recovery Technologies: Impacts on Energy, Economy and Environment, IWA Publishing.
- Metcalf & Eddy Inc. (2013) Wastewater Engineering: Treatment and Resource Recovery, McGraw Hill.
- Sperling (2007) Biological Wastewater Treatment *Series*: Volumes 1 - 6, IWA Publishing.
- B. E. Rittmann and P. L. McCarty (2001) Environmental Biotechnology: Principles and Applications, McGraw-Hill.

CLASS POLICIES:

Statement on Academic Honesty

Any student who misrepresents the work of others as his or her own will receive an "F" for the semester and will be referred to the appropriate Chairperson and/or Dean for disciplinary action.

Lectures

Students are expected to have basic knowledge of environmental engineering principles. The lectures will have an emphasis on hand-on classroom exercises and problem solving. Attendance will not be formally monitored during lecture periods. However, attendance and class participation will be considered in the evaluation of a student's desire to learn.

Homework

Homework will be assigned during the semester. Homework assignments will include problem solving and laboratory assignments. In some cases, literature review to identify critical knowledge gaps and design research experiments to fill the knowledge gaps are required. The laboratory assignments may be based existing bioreactors and research projects in Dr. Lin's group. Homework will be collected in regular class on the due days. Homework grade will be reduced by 10% for each day past the due day.

Exams and Project

Two mid-term exams will be given during the regular semester and a comprehensive final exam will be given at the end of the semester. Examinations may be in class, take home or a combination of both. In addition, you will work on a topic of your choice related to the course materials and write a final report according to the following timeline.

Grading

Grades will be calculated according to the weighting factors listed in the following table.

Homework	30%
Exam 1	20%
Exam 2	20%
Project Report	30%

TENTATIVE COURSE TOPICS
(SUBJECT TO CHANGE AT THE DISCRETION OF THE INSTRUCTOR):

A. Introduction to biological treatment of wastes
B. Microbiology and the environment
C. Microbial Kinetics
D. Activated sludge processes
E. Aerobic biofilm processes
F. Anaerobic processes
G. Nitrification/denitrification
H. Phosphorus removal
I. Innovative wastewater treatment & resource recovery
J. Drinking water treatment
K. Bioremediation
L. Contemporary research topics