

## CE 417 – ENVIRONMENTAL ENGINEERING LABORATORY

**Type (check one):** Required:   X   Elective:       

**2005-2006 Catalog Data:** CE 417. Environmental Engineering Laboratory. Laboratory work to support treatment concepts presented in CE 317. Written communication skills are required. Prerequisites: CE 317. Offered in the Fall semester. *One semester; one credit.*

**Prerequisites:** CE 317

**Co-Requisites:** None

**Textbook:** *Standard Methods: For the Examination of Water and Wastewater*, 17<sup>th</sup> Edition, American Public Health Association, 1989.

**Other Required Materials:** None

**Instructor:** Dr. L. Yu Lin, Professor of Civil and Environmental Engineering

**Course Objectives:** To support and illustrate principles as developed in CE 317 Environmental Engineering Analysis; to become familiarized with standard testing procedures as used in water and wastewater analysis; to allow the student to choose operational parameters to optimize a treatment scheme.

**Prerequisites by Topics:** None

**Topics:**

1. General Chemistry and Reactors
2. Solids Analysis – Total Solids, Volatile and Fixed Residues
3. Solids Analysis – Suspended Matter and Settleable Solids
4. Dissolved Oxygen
5. BOD and COD
6. pH and Alkalinity
7. Nitrogen Analysis – Ammonia, Nitrate
8. Phosphate Analysis
9. Chlorine and Chloride Analysis
10. Unit Operations – Sedimentation, Coagulation/Flocculation, Filtration, Activated Sludge

**Laboratory Equipment:** Environmental laboratory equipment used to support CE 417 includes pH meter, oxygen meter, spectrophotometer, incubator, mixing stirrer, temperature meter, oven, furnace, balance, and required chemicals.

**Class Schedule:** One two -hour session per week

**Prepared by:**           Dr. L. Yu Lin, P.E.           **Date:**           August, 2005

**PROFESSIONAL COMPONENT:  
CE 417 – ENVIRONMENTAL ENGINEERING LABORATORY**

Category (check one)	<input type="checkbox"/> Math/Basic Science <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> General Education <input type="checkbox"/> Other
Design (check one)	<input type="checkbox"/> Significant <input type="checkbox"/> Some <input checked="" type="checkbox"/> None
Realistic Constraints (check all that apply)	<input type="checkbox"/> Economic <input checked="" type="checkbox"/> Environmental <input type="checkbox"/> Sustainability <input type="checkbox"/> Manufacturability <input type="checkbox"/> Ethical <input checked="" type="checkbox"/> Health & Safety <input type="checkbox"/> Social <input type="checkbox"/> Political

**Relationship to Program Outcomes:**

Check all that apply:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice