CE 485 Wastewater Treatment Design 3 Units

USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

ABET Course Syllabus

Course Information, Textbook and Supplementary Materials

Capstone Course

Course Description:

Process kinetics, mass balance, reactor design, pretreatment, clarification, chemical treatment, biological treatment (aerobic and anaerobic), disinfection, sludge treatment, nitrogen and phosphorous removal, and carbon adsorption.

Capstone for: BSCE and BSCE Environmental
Required for: BSENE

Prerequisites: CE 451 Water Resources Engineering
CE 463 Water Chemistry and Analysis
CE 473 Engineering Law, Finance and Ethics
Co-Requisites: None

Required Textbook: Wastewater Engineering: Treatment Disposal and Reuse, Metcalf & Eddy, Inc. Fourth Eidtion, McGraw Hill, 2003.

Reference: None

Topics Covered	Learning Outcomes
Wastewater	Students will understand the systems and procedures of water treatment processes:
	Wastewater treatment objectives, the design process and wastewater flows
	Wastewater Composition and Loadings
Process Analysis	Physical and Chemical Unit Operations and Processes
Design and Fundamentals	Physical and Chemical Facilities
	Biological Processes
Design	Activated Sludge Process
	Facilities for Biological Wastewater Treatment
	Facilities for Biological Wastewater Treatment, and other Biological Processes
	Aeration System, Sludge Treatment and Disposal
	Treatment Plant Hydraulics and Site Development
	Water Reuse and Reclamation
	Natural Treatment Systems

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Lecture and Lab Schedule			
Lecture		**Lab**	
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session
1	3 hours	n/a	

Relation of Course Objectives to Program Outcomes

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course contributes to the program outcomes as outlined in the adjacent table.

Course Contribution to Program Outcomes (a-k)	✓ Key
c. An ability to design a system component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, manufacturability, and sustainability.	
d. An ability to function on multi-disciplinary teams.	✓
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 economic and environmental and societal context.	✓
j. Knowledge of contemporary issues.	✓

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