



SACRAMENTO
STATE

Course Change Proposal Form A



Academic Group (College): Engineering and Computer Science	Academic Organization (Department): Civil Engineering	Date: September 19, 2007
Type of Course Proposal: New <input checked="" type="checkbox"/> Change <input type="checkbox"/> Deletion <input type="checkbox"/>	Department Chair: Ramzi Mahmood Ph.D., PE	Submitted by: Kurt Ohlinger Ph.D., PE
Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	For Catalog Copy: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> CCE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Semester Effective: Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> 200 8

New course:

Subject Area (prefix) & Catalog No. (course no.): CE 39	Title: Advanced Waste Treatment	Units: 6.0
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JUSTIFICATION:

This course has been developed as a required component of the new Wastewater Treatment Plant Operation Specialist Certificate Program. The new certificate program is designed to provide students with the knowledge, skills, and abilities to competently operate wastewater treatment facilities.

NEW COURSE DESCRIPTION: (Not to exceed 80 words, and language should conform to catalog copy. See <http://www.csus.edu/acaf/univmanual/crspsl.htm>- Guidelines for Catalog Course Description)

This advanced course is a continuation of the Operation of Wastewater Treatment Plants I and II courses, and is designed to train operators in the safe and effective operation and maintenance of wastewater treatment plants. This course provides information to operators of advanced wastewater treatment plants covering enhanced biological nutrient removal treatment processes as well as physical-chemical tertiary treatment processes and wastewater reclamation.

Note:	
Prerequisite: None Enforced at Registration: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Corequisite: None Enforced at Registration: Yes <input type="checkbox"/> No <input type="checkbox"/>	
CAN (California Articulation Number):	
Graded: Letter <input type="checkbox"/> Credit/No Credit <input checked="" type="checkbox"/>	Instructor Approval Required? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Course Classification (e.g., lecture, lab, seminar, discussion): Lecture (Distance Education)	Title for SIS+/CMS (not more than 30 characters) Advanced Waste Treatment
Cross Listed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, do they meet together and fulfill the same requirement, and what is the other course.
How Many Times Can This Course be Taken for Credit? <u>1</u>	
Can the course be taken for Credit more than once during the same term? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."
See the example at <http://www.csus.edu/acaf/example.htm>

Upon completion of this course, students will be able to:

1. Demonstrate understanding of advanced wastewater treatment and laboratory analysis processes, including enhanced biological nutrient removal and physical-chemical tertiary treatment processes.
2. Articulate the skills and knowledge necessary to operate and to administer operation of advanced treatment processes at wastewater treatment plants to produce and deliver a clean, safe plant effluent suitable for reuse or for safe discharge to the environment.
3. Understand safe operation practices for working in an advanced wastewater treatment facility.
4. Demonstrate understanding and knowledge of instrumentation and control systems used for automated and remote control of advanced treatment processes.

****Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.**

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

Student assessment will be based on:

1. Passing unit examinations for each training unit comprising the course.
2. Passing a comprehensive final exam covering all aspects of wastewater treatment plant operation covered during the course.

For whom is this course being developed?

Majors in the Dept ___ Majors of other Depts ___ Minors in the Dept ___ General Education ___ Other X ___

Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes X No ___

If yes, identify program(s): **Wastewater Treatment Plant Operation Specialist Certificate Program – Certificate of Academic Achievement**

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes ___ No X ___

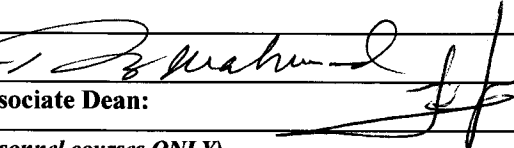

If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any). _____

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:

	Date
Department Chair: 	7/19/07
College Dean or Associate Dean: 	9/24/07
CPSP (for school personnel courses ONLY)	
Associate Vice President and Dean for Academic Programs	

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean's office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent

Course Title: Advance Waste Treatment – CE 39
6.0 Academic Credits

Course Description

This advanced course is a continuation of the Operation of Wastewater Treatment Plants I and II courses, and is designed to train operators in the safe and effective operation and maintenance of wastewater treatment plants. This course provides information to operators of advanced wastewater treatment plants covering enhanced biological nutrient removal treatment processes as well as physical-chemical tertiary treatment processes and wastewater reclamation.

Course outline

- I. Odor Control
 - A. Need for Odor Control
 - B. Odor Generation
 - C. Odor Identification and Measurement
 - D. Odor Complaints
 - E. Solutions to Odor Problems
 - F. Troubleshooting Odor Problems
 - G. Review of Plans and Specifications
 - H. Additional Reading

- II. Activated Sludge (Pure Oxygen Plants and Operational Control Options)
 - A. The Activated Sludge Process
 - B. Pure Oxygen
 - C. Return Activated Sludge
 - D. Waste Activated Sludge
 - E. Treatment of Both Municipal and Industrial Wastes
 - F. Industrial Waste Treatment
 - G. Effluent Nitrification
 - H. Review of Plans and Specifications

- III. Residual Solids Management
 - A. Need for Solids Handling and Disposal
 - B. Thickening
 - C. Stabilization
 - D. Conditioning
 - E. Dewatering
 - F. Volume Reduction
 - G. Solids Disposal
 - H. Review of Plans and Specifications

- IV. Solids Removal from Secondary Effluents
 - A. Need to Remove Solids from Secondary Effluents

- B. Solids Removal from Wastestreams Using Chemicals
 - C. Gravity Filters
 - D. Inert-Media Pressure Filters
 - E. Continuous Backwash, Upflow, Deep-Bed Silica Sand Media Filters
 - F. Cross Flow Membrane Filtration
 - G. Basic Elements of a Membrane Filtration Process
 - H. Operation of a Cross Flow Membrane System
 - I. Safety Precautions with Membrane Systems
- V. Phosphorus Removal
- A. Why is Phosphorus Removed from Wastewater?
 - B. Types of Phosphorus Removal Systems
 - C. Biological Phosphorus Removal
 - D. Lime Precipitation
 - E. Phosphorus Removal by Alum Flocculation
- VI. Nitrogen Removal
- A. Why is Nitrogen Removed from Wastewater?
 - B. Types of Nitrogen Removal Systems
 - C. Biological Nitrogen Removal
 - D. Ammonia Stripping
 - E. Breakpoint Chlorination
 - F. Lemna Duckweed System
- VII. Enhanced Biological (Nutrient) Control
- A. What is Enhanced Biological (Nutrient) Control?
 - B. Achieving Multiple Processing Objectives
 - C. Enhanced Nitrogen and Phosphorus Removal
 - D. Enhanced SVI Control to Prevent Sludge Bulking
 - E. Review of Plans and Specifications
- VIII. Wastewater Reclamation
- A. Uses of Reclaimed Wastewater
 - B. Operating Procedures
 - C. Monitoring Program
 - D. Safety
 - E. Maintenance
 - F. Review of Plans and Specifications
 - G. Land Treatment Systems
 - H. Operating Procedures
 - I. Monitoring Program
 - J. Safety
 - K. Maintenance
 - L. Review of Plans and Specifications
 - M. References and Additional Reading

- IX. Instrumentation and Control Systems
 - A. Instrumentation and Control Systems
 - B. Safety Hazards of Instrumentation and Control Systems
 - C. Measured Variables and Types of Sensors
 - D. Categories of Instrumentation
 - E. Operation and Preventive Maintenance
 - F. Additional Reading

Required text

Advanced Waste Treatment, 5th Ed. (2006), Prepared by the CSU Sacramento Office of Water Programs.

Recommended Reference

Standard Methods for the Examination of Water and Wastewater, 20th Ed. (1998), Prepared by the American Public Health Association, American Water Works Association, and Water Environment Federation.

Expected Learning Knowledge, Behavior, and Attitude Outcomes and Competencies

1. Demonstrate understanding of advanced wastewater treatment and laboratory analysis processes, including enhanced biological nutrient removal and physical-chemical tertiary treatment processes.
2. Articulate the skills and knowledge necessary to operate and to administer operation of advanced treatment processes at wastewater treatment plants to produce and deliver a clean, safe plant effluent suitable for reuse or for safe discharge to the environment.
3. Understand safe operation practices for working in an advanced wastewater treatment facility.
4. Demonstrate understanding and knowledge of instrumentation and control systems used for automated and remote control of advanced treatment processes.

Assessment Strategies and Evidence of Competency

1. Pass unit examinations for each training unit comprising the course.
2. Pass a comprehensive final exam covering all aspects of wastewater treatment plant operation covered during the course.