

5. **Wastewater Treatment Plants Planning, Design and Operation** by Syed R. Qasim, CRC Press, Current Edition (Second Edition, 1999, ISBN: 1-56676-688-5).
6. **Waste Management Practices, Municipal, Hazardous, and Industrial** by John Pitchel, CRC, Taylor & Francis Group, LLC, Current Edition (First Edition, 2005, ISBN: 0-8493-3525-6).

OTHER MATERIALS: Handouts may be provided as needed. It is recommended that students take notes in a three ring binder since they may be receiving handouts throughout the semester. **SPSU email** and **GeorgiaView/Vista** systems will be used for messages and content delivery, respectively. Students should access these sites regularly.

COURSE OBJECTIVES: To introduce students to the integrated science, engineering, design and management concepts of engineered environmental systems. The course will cover the design of water and wastewater treatment units, air pollution control devices, solid and hazardous waste disposal units and the concepts of hazardous waste site remediation technologies and sludge treatment, dewatering and disposal.

COURSE LEARNING OUTCOMES: Upon successful completion of this course, students shall be able to:

- analyze and design water and wastewater treatment process units.
- analyze and design conventional and land-based sludge treatment, dewatering, and disposal units.
- analyze and design air pollution control devices.
- identify the design parameters for solid and hazardous waste disposal units.

COURSE REQUIREMENTS:

1. **Attendance:** Students are expected to attend class. Advance notice of an absence should be provided whenever possible. Makeup exams, quizzes, and acceptance of late assignments will be considered only for documented medical reasons, emergency circumstances, or other university sponsored activities.
2. **Homework/Project:** Occasional homework may be assigned for this course. Homework/Design **project** assignments must be submitted in the next class following the class in which the topic is discussed or a different date assigned by the instructor. Late homework/project WILL NOT be accepted. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions. All projects must be submitted on 8½"x11" white paper or on engineering design paper with a cover page (preferably typed and computer printed). Cover page should include student's name, course number and name, assignment number, assignment date, and due date. Show the detail works for full credit. Graded homework/project will be returned to students; however, students need to preserve them until the grades are finalized and show them to the instructor if there are any disputes in grades.
3. **Exams:** All exams are closed books and notes unless advised otherwise. NO make-up exams will be given. Exceptions may be considered in case of illness, serious emergencies, or other

university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions. Graded exams will be returned to students; however, students need to preserve them until the grades are finalized and show them to the instructor if there are any disputes in grades.

4. **Cheating:** Cheating on assignment and particularly on the examinations will not be tolerated. If you are caught cheating, you will get zero on the exam. You will be asked to move if you are caught looking at another student's work. The instructor reserves the right to remove any student from the class if the student's behavior is of a disruptive nature or if there is an evidence of academic dishonesty.
5. **Term Paper/Presentation:** No term paper will be assigned for this course. However, group project will be assigned, as necessary, for any design works. The group design works need to be presented using PowerPoint presentations in the class for grades.
6. **Class Decorum:** No cell phone use, checking emails, eating, and/or multitasking are allowed during the class. For emergency, cell phone can be operated in vibration mode; however, students can receive an emergency call only stepping out of the class room.
7. **Honor Code:** SPSU has an Honor Code and a procedure for handling cases when academic misconduct is alleged. All students should be aware of them. Information about the Honor Code and the misconduct procedure may be found at <http://www.spsu.edu/honorcode/>.
8. **ADA Provisions:** "Students with disabilities, as defined by the Americans with Disabilities Act (ADA) of 1990, should contact the instructor during the first week of the semester regarding the accommodations necessary to complete the requirements of this course. The instructor, with the help of SPSU, will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA." The students can also contact SPSU ADA coordinator at 678-915-7244 for additional help."

GRADING POLICY: All exams, quizzes, and assignments must be completed satisfactorily in order to pass the course. The evaluation process described below is subject to change by the instructor. The changes will be announced in the class.

<u>Class Work:</u>		<u>Total Grade:</u>			
1. Design Project	- 40%	<u>Scale, Letter Grade, and GPA</u>			
2. Project Presentation	- 10%	90% - 100%	A	4.0 (Excellent)	
3. Mid Term 1	- 15%	80% - 90%	B	3.0 (Good)	
4. Mid Term 2	- 15%	70% - 80%	C	2.0 (Satisfactory)	
5. Final Exam	- 20%	60% - 70%	D	1.0 (Passing)	
		< 60%	F	0.0 (Failure)	
TOTAL	- 100%	--	WF	0.0 (Withdrawn after deadline)	

The following symbols are approved for use in the cases indicated, but will not be included in the determination of the grade point average.

"I" This symbol indicates that the student was doing satisfactory work but, for non-academic reasons beyond his control, was unable to meet the full requirements of the course. The requirements for removal of an "I" are

left to the respective institutions; however, if an "I" is not satisfactorily removed after three quarters of residence, the symbol "I" will be changed to the grade "F" by the appropriate official. (See Southern Tech policy - Removal of an Incomplete "I", on page 2).

"W" This symbol indicates that a student was permitted to withdraw without penalty. Withdrawals without penalty will not be permitted after the mid-point of the total grading period (including final examinations) except in cases of hardship as determined by the appropriate official of the respective institution.

"V" This symbol indicates that a student was given permission to audit this course. Students may not transfer from audit to credit status or vice versa.

"K" This symbol indicates that a student was given credit for the course via a credit by examination program approved by the respective institution's faculty (CLEP, AP, Proficiency, etc.)

SCHEDULE: **Two 75-minute classes** or 3-50 minute classes or 1-150 minutes class per week.

TENTATIVE LECTURE TOPIC/OUTLINE: The following lecture topics/outlines are subject to change by the instructor. The changes will be announced in the class.

Class/Week	Tentative Lecture Topic/Outline	Chapter
Week 1 – 4	Water Treatment – Flocculant (Type II) sedimentation and design of water treatment unit processes.	Chapter 4 + Handouts
Week 4	Mid Term Exam 1	---
Week 5 – 7	Wastewater Treatment – design of unit processes for primary, secondary, and tertiary/advanced treatment of wastewater.	Chapter 6 + Handouts
Week 8 – 10	Sludge Management – design of units for sludge treatment, dewatering, and disposal.	Chapter 6 + Handouts
Week 10	Mid Term Exam 2	---
Week 11-12	Air Pollution – design of air pollution control devices.	Chapter 7 + Handouts
Week 13	Solid Waste Management - design concepts of municipal solid waste (MSW – Subtitle D) landfills.	Chapter 9 + Handouts
Week 15	Hazardous Waste Management - design concepts of hazardous waste (Subtitle C) landfills.	Chapter 10 + Handouts
Week 16	Final Exam	---

ABET CATEGORY: Engineering science: 1 credit hour (33%)
Engineering design: 2 credit hours (67%)