
DIVISION OF ENGINEERING
CIVIL AND CONSTRUCTION ENGINEERING PROGRAM

COURSE SYLLABUS

COURSE TITLE: Environmental Engineering **TERM:** Spring
COURSE: CE 3702 **YEAR:** 2012
SECTION NO.: 01 **TIME:** *Lecture* TBD 1:30-2:45 pm
PLACE: M TBD

INSTRUCTOR: Dr. M. A. Karim, P.E. **OFFICE LOCATION:** M TBD

OFFICE HOURS: MW 12:00-03:00 pm **OFFICE PHONE:** (678) 915-0000
TR 10:00-01:00 pm **HOME PHONE:** (804) 986-3120 (Cell)
Other hours by appointment **E-MAILS:** mkarim@spsu.edu
makarim@juno.com

DEPARTMENTAL PHONE: (678) 915-4220

NUMBER OF CREDIT HOURS: 3-0-3 (Lecture-Lab-Total)

PREREQUISITS: ENGR 3343 (Fluid Mechanics) and CHEM 1212 (Chemistry II)

COREQUISITS: NONE

COURSE DESCRIPTION: Introduction to environmental engineering issues, legal aspects, engineering solutions, and basic approaches to abatement system design including hydrology, water treatment, water quality management, and wastewater treatment.

REQUIRED or ELECTIVE: Required

REQUIRED TEXT: **Introduction to Environmental Engineering** by Mackenzie L. Davis and David A. Cornwell, McGraw-Hill Book Company, Current Edition (Fourth Edition, 2008; ISBN: 978-0-7-242411-9).

REFERENCES: None

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 **BLACKBOARD/WebCT** systems will be used for message and content delivery, respectively. Students should access these sites regularly.

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

- understand how Federal/State environmental regulations and standards are developed as well as their impact;
- identify and discuss environmental engineering issues related to water, water quality, and wastewater;
- recommend acceptable environmental treatment technologies for given situations pertaining to water, water quality, and wastewater;
- solve fundamental problems and design common unit operations/processes pertaining to water, and wastewater;
- design sludge treatment units, identify and design processes used to remove nutrients and suspended solids from wastewater, analyze and design sludge dewatering and disposal units, evaluate natural land-based treatment systems, analyze and design on-site wastewater treatment and disposal systems; and evaluate and discuss various options for wastewater disposal and reuse; and
- obtain the necessary background for subsequent courses in environmental engineering.

COURSE REQUIREMENTS:

1. **Attendance:** Students are expected to attend class. Advance notice of an absence should be provided whenever possible. Makeup exams and acceptance of late assignments will be considered only for documented medical reasons, emergency circumstances, or other university sponsored activities.
2. **Homework:** All problem assignments must be submitted in the next class following the class in which the topic is discussed. Late homework 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 homework must be submitted on 8½"x11" white paper or on engineering design paper (preferable) with a cover page. Cover page should include student's name, course number and name, assignment number, assignment date, and due date.
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.
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.
5. **Term Paper/Presentation:** No term paper/presentation for this course.

6. **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 will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA.”

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

<u>Class Work:</u>		<u>Total Grade:</u>			
1. Mid Term 1	- 15%	Scale, Letter Grade, and GPA			
2. Mid Term 2	- 20%	90% - 100%	A	4.0 (Excellent)	
3. Mid Term 3	- 20%	80% - 90%	B	3.0 (Good)	
4. Final Exam	- 35%	70% - 80%	C	2.0 (Satisfactory)	
5. Homework	- 10%	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 topic/outline is subject to change by the instructor. Changes will be announced in the class.

<u>Class/Week</u>	<u>Tentative Lecture Topic/Outline</u>	<u>Chapter</u>
Week 1 - 2	Introduction to environmental engineering issues, legal aspects, engineering solution, and basic approaches to abatement system design.	Chapters 1 & 2 + Handouts

Class/Week	Tentative Lecture Topic/Outline	Chapter
Week 3 - 4	Hydrology and Hydrologic Cycle - precipitation, evaporation, transpiration, interception, percolation, etc., an overview of surface and groundwater hydrology, rainfall and runoff analysis, storage of reservoirs, and groundwater and well hydraulics. <i>Review for Mid Term Exam 1.</i>	Chapter 3 + Handouts
Week 4	Mid Term Exam 1	---
Week 5 -7	Water Treatment - physical, chemical, and biological treatment of water such as sedimentation, filtration, chlorination, coagulation, flocculation, water softening, activated sludge, and trickling filter. <i>Review for Mid Term Exam 2.</i>	Chapter 4 + Handouts
Week 7	Mid Term Exam 2	---
Week 8 - 9	Water Quality Management – Definition and uses of biochemical oxygen demand (BOD) and chemical oxygen demand (COD), determination of BOD rate constant (k), and development of dissolved oxygen (DO) sag curve using Streeter Phelps' equation for a stretch of stream/river. <i>Review for Mid Term Exam 3.</i>	Chapter 5 + Handouts
Week 9	Mid Term Exam 3	---
Week 10 – 15	Wastewater Treatment - wastewater microbiology, characteristics of wastewater, physical, chemical and biological treatment of wastewater such as on-site wastewater treatment and disposal systems, unit operations of pretreatment, primary treatment, unit processes of secondary treatment, tertiary/advanced treatment, disinfection, various options for wastewater disposal and reuse. Sludge Management - sludge treatment units, sludge dewatering and disposal units, natural land-based sludge treatment systems. <i>Review for the Final Exam.</i>	Chapter 6 + Handouts
Week 16	Final Exam - Comprehensive	---

ABET CATEGORY: Engineering science: 70%
Engineering design: 30%