CE 310 -Construction Materials

Prerequisites: MAE 243, 3
Credit hours - 3, contact hours - 45

Instructor: John Zaniewski, ESB 651c, Office hours: TR 10:00 to 12:00
Text: *Materials for Civil and Construction Engineers*, Mamlouk and Zaniewski, **Fourth edition**, Prentice Hall 2016

Objective: All civil engineers must know the properties of the materials used for the infrastructure. This course introduces each of the commonly used materials with respect to their behavior, performance, production and constructability.

Elective course for BSCE

Expected Learning Outcomes - Upon successful completion of this course students will:

Goals by topic	student outcome
Understand the selection of materials for civil engineering projects and works.	A
Be knowledgeable of the physical, chemical and mechanical behavior of materials used in civil engineering projects.	
Understand the properties of ferrous materials and the effect of alloying agents and heat treatments on their behavior.	
Know the significant properties of aggregate materials as needed for Portland cement concrete and asphalt concrete.	
Be able to perform a Portland cement concrete mix design and understand how mix quantities affect the properties of concrete. Understand the production, placement, finishing and curing of Portland cement concrete.	C,K
Be able to perform an asphalt cement concrete mix design and understand how mix quantities affect the properties of hot mix asphalt. Understand the production, placement, finishing and curing of Portland cement concrete.	C,K
Understand the properties of wood needed for civil engineering design.	
Have a basic understanding of the use of composite materials in civil engineering.	

ABET Student Outcomes

A - An ability to apply knowledge of mathematics, science, and engineering

C - An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

K - An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Assignments: The reading assignments are indicated on the attached sheet. Quizzes may be used to assess preparedness, if you are not in class on the day of a quiz, it is assumed you are not prepared. Homework will be assigned during the semester. All assignments are due at the beginning of class. Late assignments will not be accepted.

Attendance: You are expected to attend all classes. You are expected to come to class on time. If you have a specific problem with attendance notify me prior to class, unless the emergency is such that this is not possible. In the event of an emergency, notify me as soon as

possible. Failure to attend a test or the final exam will result in a score of 0 (zero) unless the absence is excused for an appropriate reason.

Grading: Final grades will be based on 90%, 80%, 70%, 60%, and <60% corresponding to A, B, C, D, and F. The instructor reserves the right to curve up. **To pass this class, you must earn a 60% average on the tests and final.** Once this criterion is met, grades will be based on a weighted average: Homework and quizzes 10%, Tests 50%, and Final 40%

During the test and final – the college guidelines will be followed.

Week			Topic	Reading
1		8/16	Introduction to Civil Engineering Materials & Measurements	Ch 1
2	8/21	8/23	Nature of Materials	Ch 2
3	8/28	8/30	Steel	Ch 3
4	9/4	9/6	**Test 1,** Steel	
5	9/11	9/13	Aggregates	Ch 5
6	9/18	9/20	Aggregates, Portland Cement	Ch 6
7	9/25	9/27	Portland Cement, **Test 2**	
8	10/2	10/4	Portland Cement Concrete	Ch 7
9	10/9	10/11	Portland Cement Concrete	
10	10/16	10/18	Asphalt Binders, **Test 3**	Ch 9
11	10/23	10/25	Asphalt Concrete	
12	10/30	11/1	Asphalt Concrete	Ch 10
13	11/6	11/8	**Vote**, **Test 4**	
14	11/13	11/15	Wood	Ch 11
15	11/27	11/29	Composites	
16	12/4	12/6	Composites	
Final			12/14/18 11:00 – 1:00	