CE 3223 CIVIL ENGINEERING MATERIALS
FALL 2013

Department: Civil Engineering
Professional Component: 3 Credit Hours, Engineering Topics

Class Time: Lecture: M/W 12:00 PM – 12:50 PM; LSW 131
Lab: R 2:00 PM – 4:50 PM; LSW 240

Course Description:

This course will cover the following topics:

- Theory and application of materials used in civil engineering.
- Aggregate and concrete testing.
- Concrete mix design.
- Asphalt mix design and testing.

Course Objectives:

- Students will have a better understanding of the fundamental behavior of concrete, asphalt, and timber.
- Students will be capable of designing concrete mixes for specific needs.
- Students will be familiar with current asphalt mix design and testing methods.
- Students will gain experience with designing and conducting experiments to achieve stated goals.
- Students will further develop skills for preparing an effective technical report.

Instructor: Zahid Hossain, Ph.D.
Office: ABI #318
Office Hours: M/W 1:00 PM -2:30 PM or by appointment.
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Relation to Program Outcomes:

- Outcome No. 2: *An ability to design and conduct experiments, as well as to acquire, analyze, and interpret data.*

- Outcome No. 6: *An ability to communicate effectively, both orally and in writing*.

- Outcome No. 10: *All graduates will have an ability to use the techniques, skills, and modern tools necessary for entry-level practice in their area of concentration. The student will use modern tools, such as Excel, AutoCAD, and HEC or similar software, to prepare reports and engineering drawings.*

Class Policies:

- Class policies will follow applicable university rules and policies for attendance, cheating and Plagiarism.
- If a lab period must be missed, the student must inform the lab instructor before missing the lab and arrangements will be made to provide lab data to the student so that he or she can write the required report.
- Disabled students are encouraged to register with the Office of Disability Services. Thereafter, they are invited to schedule appointments to see the instructor during his office hours to discuss accommodations and other special needs.
- The University email system will be the official method of communication. If you have an objection to this rule, then please contact the instructor.

Specific Course Information

Prerequisites: A grade of "C" or better in ENGR 2413 (Mechanics of Materials)

Textbook: Mamlouk, M.S. and J. P. Zaniewski, *Materials for Civil and Construction Engineers*, Third Edition, 2010, Pearson Prentice Hall, Upper Saddle River, NJ.

Reference: Engineering Program Standards Committee, *Engineering Course Standards*, latest edition.

Other Required Material: Handouts on ASTM standards, ACI concrete mix design, and Asphalt Institute Superpave mix design are provided.

Grading System

It is anticipated that grades will be based on the following scale:

90.0	-	A
80.0 –89.9	-	B
70.0 – 79.9	-	C
60.0 – 69.9	-	D
Less than 60.0	-	F

Anticipated Point Totals:

Four lab assignments	**650**	
Lab assignment No. 1		100
Lab assignment No. 2		200
Lab assignment No. 3		250
Lab assignment No. 4		100
One final exam	**200**	
Homework	**100**	
Participation/Professionalism	**50**	
	1000	

Grading Policy:

- Late homework will be accepted for reduced credit until the assignment has been graded and returned to the class.
- Students will be given a week to turn in the lab assignments. Late Lab assignment will **not** be accepted for reduced credit.

Class Topics and Assignment Schedule:

The following is a tentative class schedule. Schedule modifications and adjustments will be applied as necessary as the semester progresses.

Week No.	Date	Topic	Assignments
1	8/19/13	Course Introduction/Lab Safety	
		Introduction to Materials Engineering	Chapter 1
		Nature of Materials	Chapter 2
2	8/26/13	Aggregates	Chapter 5
3	9/2/13	Labor Day	
		Aggregates (cont.)	
4	9/9/13	Aggregates (cont.)/Lab Reports	
		Portland Cement/Mixing Water/Admixture	Chapter 6
5	9/16/13	Portland Cement/Mixing Water/Admixture	
6	9/23/13	Portland Cement Concrete	Chapter 7
		Portland Cement Concrete (cont.)	
7	9/30/13	Portland Cement Concrete (cont.)	
		Portland Cement Concrete (cont.)	
8	10/7/13	Portland Cement Concrete (cont.)	
		PCA Films on Concrete Tests	
9	10/14/13	Portland Cement Concrete (cont.)	
		Portland Cement Concrete (cont.)	
10	10/21/13	Portland Cement Concrete (cont.)	
		Asphalt Binders and Asphalt Mixtures	Chapter 9
11	10/28/13	Asphalt Binders and Asphalt Mixtures (cont.)	
		Asphalt Binders and Asphalt Mixtures (cont.)	
12	11/4/13	Asphalt Binders and Asphalt Mixtures (cont.)	
		Asphalt Binders and Asphalt Mixtures (cont.)	
13	11/11/13	Asphalt Binders and Asphalt Mixtures (cont.)	
		Asphalt Binders and Asphalt Mixtures (cont.)	
14	11/18/13	Asphalt Binders and Asphalt Mixtures (cont.)	
15	11/25/13	Thanksgiving Break	
16	12/2/13	Last day of classes (Review)	
		Final Exam (check academic calendar)	

Laboratory Topics and Assignment Schedule:

Week No.	Date	Topic	Assignments
1	8/22/13	No Lab – May do cleanup & preparation	
2	8/29/13	Modulus of Elasticity of Concrete	
3	9/5/13	PCA Film, Prep Aggregate Tests	
4	9/12/13	Aggregate Tests for Concrete	Lab Report1*
5	9/19/13	Aggregate Tests for Concrete	
6	9/26/13	PCA Films on Mix Design/Tests	
7	10/3/13	Setup for Concrete Mix/Testing	Lab Report 2*
8	10/10/13	1st Trial Mix/Field Tests	
9	10/17/13	Prep Mixes/Tests for 3 W/C Ratios	
10	10/24/13	7-Day Strength/Tour Asphalt Plant	
11	10/31/13	14-Day Strength/Gyratory Compactor	
12	11/7/13	21-Day Strength/Prepare Asphalt Specimens	
13	11/14/13	28-Day Strength & Modulus of Rupture	
14	11/21/13	Test Asphalt Specimens	Lab Reports 3 / 4*
15	11/28/13	Thanksgiving	

*: Due