CE 5351 Mechanistic Pavement Design and Analysis
MW 6:00 pm - 7:20 pm
Classroom Building C 304
Spring 2019

Instructor: Carlos M. Chang, Ph.D., P.E. Office: A-205
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Office Hours: Students are always welcome

Main References:

Other References:
• Mallick, R, and El-Korchi, T., Pavement Engineering (2009), CRC Press.
• Additional handouts will be provided during the course.

COURSE OBJECTIVES

The objective of this course is to learn and apply the principles of pavement design with an emphasis on mechanistic-empirical design methods. Concepts, methods, and tools to perform pavement analysis and design are learned in this course including:
• Pavement mechanistic theories of stress distribution in all types of pavements, the effects of static and moving loads on these stresses and the development of traffic analyses and equivalency factors.
• Pavements and methods for pavement material characterization, in situ and in the laboratory.
• Empirical methods for pavement design are explained in this course as an introduction to mechanistic methods.
• Mechanistic-Empirical (M-E) Pavement Design Methods.

MAIN TOPICS

1. Introduction (Sections 1.2-1.5)
2. Stresses and Strains in Flexible Pavements (Sections 2.1-2.3)
3. Stresses and Deflections in Rigid Pavements (Sections 4.1-4.4)
4. Traffic Loading and Volume (Sections 6.1-6.4)
5. Material Characterization (Section 7.1-7.5)
6. Drainage Design (Section 8.1-8.3)
7. Pavement Performance (Section 9.1-9.3)
8. Reliability (Section 10.1-10.5)
9. Flexible Pavement Design (Sections 11.1-11.4)
10. Rigid Pavement Design (Sections 12.1-12.3)

Note: Sections in parenthesis refers to Huang’s book.
GRADING

Your grade for this course will be determined on the basis of 100 points as follows:

- Homework and Quizzes: 25 points
- Final Assignment: 30 points
- Midterm Exam: 20 points
- Final Exam: 25 points

Final grades are based on the normal distribution of points as shown below:

- A: 100 - 90
- B: 89 - 80
- C: 79 - 70
- D: 69 - 60
- F: < 60

The instructor reserves the right to revise this grading plan. However, students will be informed of any changes during the semester.

In accordance with University regulations, students who miss examinations will receive grades of zero. Exceptions to this rule will be made only on a carefully considered individual basis under extraordinary circumstances and only if the student contacts the instructor one week before the exam. If you know in advance that you are going to miss an exam, it is your responsibility to inform the instructor before the exam.

Any discrepancies with your grades in homework, quizzes, or exams need to be resolved no later than 7 calendar days after you have received your grade.

ATTENDANCE

Students are expected to attend all class periods. Those who fail to attend class regularly are inviting scholastic difficulty and, with the approval of the Dean of the College of Engineering, may be dropped from the course with a grade of F for repeated (4 or more) unexcused absences.

TEACHING METHODOLOGY

The teaching methodology is learner-centered based on active learning techniques. Read in your textbook the topic to be discussed prior to the class and review the subject thoroughly after the class. Students will also be assigned topics to investigate in order to present in the class. In addition, state-of-the art software tools are provided to the students for pavement analysis and design.

HOMEWORK AND QUIZZES

Homework will be assigned nearly for every class module. The student must turn in the homework on time. Homework problems up to one week late will earn a maximum of 50% of the total grade. Past one week, the homework will not be accepted.
FINAL ASSIGNMENT
A final assignment is given to apply concepts, methods, and pavement design tools learned in this course.

EXAMS

Two Midterms and Final Exam will be given in the course. Exams are comprehensive and cover all topics up to that date. The exam dates will be announced at least one week in advance.

ATTENDANCE

Students are expected to attend all class periods. Those who fail to attend class regularly are inviting scholastic difficulty and, with the approval of the Dean of the College of Engineering, may be dropped from the course with a grade of F for repeated (4 or more) unexcused absences.

DISABILITIES

Students with disabilities will be accommodated. Students are required to notify the instructor of any disability at least one week before the start of class.

POLICY ON CHEATING

Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university. Policies on scholastic dishonesty will be strictly enforced.

COURSE/INSTRUCTOR EVALUATION

A course/instructor evaluation will be conducted in class near the end of the semester.

FINAL COMMENT

The instructor expects all the students to succeed in learning the course subjects. It is critical for your success to establish a good studying habit in order to do very well in the class.

If you feel that you are not understanding a subject, please do not hesitate to ask questions in class, or if necessary, to see your instructor or teaching assistant outside of class. Any specific comments that students have on how the course might be improved are particularly welcome.