

# CE 367 P: Pavement Design and Performance

*Unique Number: 15460*

*Updated: 15 August 2017*

- Instructor:** Jorge A. Prozzi ([prozzi@mail.utexas.edu](mailto:prozzi@mail.utexas.edu))  
ECJ 6.112, Phone: 471-4771
- Class:** Tue-Thu 3:30 to 5:00 PM @ ECJ B.226
- Office hours:** Tue-Thu 9:30 to 10:30 AM @ ECJ 6.112
- Textbook:** *Pavement Analysis and Design* by Yang H. Huang, Second Edition, Pearson Prentice Hall, New Jersey, 2004
- Handouts:** Supplementary handouts will periodically be distributed in class.

## **Additional Reading Material:**

This is a list of alternative not-required textbooks that cover similar material:

*Pavement Design and Materials*, by A. T. Papagiannakis and E. A. Masad, John Wiley and Sons, 2008.

*The Design and Performance of Road Pavements*, by D. Croney and P. Croney, Second Edition, McGraw-Hill, 1991.

*Highway Materials, Soils and Concrete*, by H. N. Atkins, Third Edition, Prentice Hall, 1980. 4.

*Principles of Pavement Design*, by E. J. Yoder and M. W. Witczak, Second Edition, Wiley Interscience, 1975.

## **Course Objectives:**

To introduce the student to the principles of empirical and mechanistic-empirical structural pavement design. Traffic characterization, materials selection and testing procedures will also be addressed so, at the end of the course, the student will be able to design selected pavement structures for a number of typical performance standards, material availability and environmental conditions.

Students will also be introduced to the concepts of pavement performance and design reliability.

## **Prerequisite:**

Civil Engineering 324P

## **GRADING SYSTEM**

The +/- grading system will be used in determining the final course grade. The final grade will result from the sum of the following four components (total 100 points):

### **Contribution to the learning process, class participation, attendance and quizzes: 10 points**

Class attendance and participation are very important. Reading assignments will be given every class (see Tentative Course Schedule). Students have to read the given sections of the textbook before the following class. There will be several UNANNOUNCED short quizzes during regular class time. These quizzes will cover material from the reading assignment and material previously covered in class.

### **Homework Assignments: 20 points**

Assignment should be handed in BEFORE class begins on the dates indicated on each specific assignment. Late homework will not be graded (i.e. late homework will receive 0 points). The homework solutions should be neatly presented and full answers should be included. In the top right corner of the first sheet, the following information should appear: full name, homework number, total number of sheets, and date. If more than one sheet is used, all sheets should be numbered and stapled together. Homework assignments constitute an important part of the final grade and are COMPULSORY.

### **Mid-Term Exams: 30 points**

There will be two 75-minute mid-term exams during regular class times on the dates indicated in the Tentative Course Schedule. These exams are close book. There will be no make-up exams.

### **Term Project (Oral Presentation and Final Paper): 40 points**

During the semester the students will work on a selected topic on pavement design and performance. Towards the end of the semester, this work will be presented in class and evaluated by the course instructor. Details on the specific topics will be given during the second week of class.

## **MISCELLANEOUS**

In accordance with University regulations, students who miss examinations will receive grades of ZERO. There are no exceptions to this rule. If a student is going to miss an exam he/she should contact the professor BEFORE the exam.

**Disability statement**

The University of Texas at Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259 (Videophone: 512-410-6644) or <http://diversity.utexas.edu/disability/>

**Course Instructor Survey/Evaluation**

An evaluation of the course and instructor will be conducted at the end of the semester using the approved UT Course/Instructor evaluation forms.

**Undergraduate student Drop policy**

From the 1st through the 12th class day, an undergraduate student can drop a course via the web and receive a refund, if eligible. From the 13th through the university's academic drop deadline, a student may Q drop a course with approval from the Dean, and departmental advisor.

**Academic Integrity**

University of Texas Honor Code: The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Each student in this course is expected to abide by the University of Texas Honor Code. Any work submitted by a student in this course for academic credit will be the student's own work. Collaboration is allowed in the instances specified by the instructor.

Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Code can also be extended to include failure of the course and University disciplinary action.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

## Tentative Class Schedule

Date	Subject	Reading
Thursday, August 31, 2017	Introduction: brief introduction to the class; overview, pavement types, design approaches	Chapter 1: All Sections
Tuesday, September 05, 2017	Traffic: characterization for pavement design and concepts of equivalent loads	Chapter 6: Sections 6.1 & 6.2
Thursday, September 07, 2017	Traffic: traffic volumes and traffic loads and analysis for pavement design	Chapter 6: Sections 6.3 & 6.4
Tuesday, September 12, 2017	Materials: pavement materials and characterization of untreated granular materials	Chapter 7: Sections 7.1 & 7.2
Thursday, September 14, 2017	Materials: fatigue and permanent deformation of asphalt concrete materials	Chapter 7: Sections 7.3 & 7.4
Tuesday, September 19, 2017	Materials: performance testing and analysis; characterization of cement concrete materials	Chapter 7: Section 7.5
Thursday, September 21, 2017	Pavement Performance: description and identification of distress in asphalt pavement	Chapter 9: Section 9.1
Tuesday, September 26, 2017	Pavement Performance: riding quality and surface characteristics of pavements	Chapter 9: Section 9.2 & 9.3
Thursday, September 28, 2017	Pavement Performance: introduction to non-destructive testing and backcalculation	Chapter 9: Section 9.4
Tuesday, October 03, 2017	Flexible Pavements: principles of mechanistic design. The Asphalt Institute Method	Chapter 11: Sections 11.1 & 11.2
Thursday, October 05, 2017	Flexible Pavements: the AASHTO Design Method for Flexible Pavements	Chapter 11: Sections 11.3
Tuesday, October 10, 2017	Flexible Pavements: additional considerations for the design of flexible pavements	Chapter 11: Sections 11.4
Thursday, October 12, 2017	Review Session: comprehensive review in preparation for first mid-term exam	
Tuesday, October 17, 2017	<b>First Mid-Term</b>	
Thursday, October 19, 2017	Term Paper Update	
Tuesday, October 24, 2017	Term Paper Update	
Thursday, October 26, 2017	Rigid Pavements: principles of mechanistic design. Distress types	Chapter 12: Sections 12.1
Tuesday, October 31, 2017	Rigid Pavements: Portland Cement Association Method	Chapter 12: Sections 12.2
Thursday, November 02, 2017	Rigid Pavements: the AASHTO Design Method for Rigid Pavements	Chapter 12: Sections 12.3
Tuesday, November 07, 2017	Rigid Pavements: design of Continuously Reinforced Concrete Pavements	Chapter 12: Sections 12.4 & 12.5
Thursday, November 09, 2017	Pavement Management Systems	Appendix E: E.1 to E.3
Tuesday, November 14, 2017	Pavement Management Systems	Appendix E: E.4 to E.7
Thursday, November 16, 2017	<b>Second Mid-Term</b>	
Tuesday, November 21, 2017	Mechanistic-Empirical Pavement Design Guide: introduction	Appendix F
Thursday, November 23, 2017	Thanksgiving Holiday	
Tuesday, November 28, 2017	Mechanistic-Empirical Pavement Design Guide: introduction	
Thursday, November 30, 2017	Term Paper Presentations	
Tuesday, December 05, 2017	Term Paper Presentations	
Thursday, December 07, 2017	Term Paper Presentations	

**IMPORTANT:** Paper format: TRB Guidelines. Final papers should be submitted electronically to the instructor in MS Word.