

CEE 633
Mechanistic Principles of Pavement Design

Catalog data:	20-CEE-633. Mechanistic Principles of Pavement Design. 3 ug./gr. cr. Pavement structural analysis. Principles of similitude. Numerical procedures. Mechanistic-based design concepts. Recent advances. Mechanistic-based design procedures for flexible and rigid highway pavements.
Prerequisites:	20-CEE-607; Pavement design, strength of materials, soil mechanics, construction materials, and transportation engineering.
Textbook:	Ioannides, A.M., <i>CEE 633-Mechanistic Principles of Pavement Design: Supplementary Class Notes</i> , UC, Cincinnati, OH, 1997. Huang, Y.H., <i>Pavement Analysis and Design</i> , Prentice Hall, Inc., Englewood Cliffs, NJ, 1993.
References:	Ioannides, A.M., <i>CEE 613-Computer Aided Pavement Engineering: Supplementary Class Notes</i> , UC, Cincinnati, OH, 2004. Ioannides, A.M., <i>CEE 607-Pavement Design: Supplementary Class Notes</i> , UC, Cincinnati, OH, 1999.
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Goals:	To explore the strengths and limitations of emerging mechanistic-based pavement design concepts. To train students in the practical design-office applications of mechanistic-based design procedures, and familiarize them with the lab testing and analytical tools required for this purpose. To provide hands-on experience in the use of state-of-the-art mechanistic-based design procedures for flexible and rigid highway and airport pavements.
Lecture or lab topics:	<ol style="list-style-type: none">1. Mechanistic-based design concepts. (2 classes)2. Pavement structural analysis (closed-form and numerical solutions). (5 classes)3. Back calculation procedures for material characterization. (2 classes)4. Mechanistic-based pavement designs for flexible and rigid highway pavements. (5 classes)5. Mechanistic-based pavement designs for flexible and rigid airport pavements. (4 classes)6. Limitations of mechanistic-based design procedures. (1 class)7. Test. (1 class)
Computer usage:	Hands-on experience with several pavement engineering softwares. At least two, as well as an open-ended special project involve use of such software. Computer spreadsheets, word processing, computerized graphing strongly encouraged.
ABET criterion 3:	a, c, e, f, g, h, i, j, k
ABET criterion 8:	a, d
Date prepared:	December 09, 2003, Last Update April 25, 2007