

Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 5610/4610 – Pavement Design

- 2017 Catalog Data: CEE 5610: Pavement Design Credit 3. Advanced topics; materials for pavements, pavement distress, flexible pavement design, rigid pavement design, pavement preservation, design of pavement overlays, pavement recycling. Students enrolled in the 5000- level course will be required to complete additional work as stated in the syllabus.
- Required Textbook: Principles of Pavement Design, 2nd Ed. Yoder & Witzack, 2nd Edition, John Wiley & Sons, Inc., 1975.
- Faculty Coordinator: L. K. Crouch, Professor of Material in Civil Engineering
- Prerequisites: CEE3610: Transportation Engineering
- Goal: To familiarize the student with the techniques and materials used in design, construction and rehabilitation of flexible and rigid pavements. The anticipated topics are 1) materials for pavements; 2) pavement distress; 3) flexible pavement design; 4) rigid pavement design; 5) pavement preservation; 6) design of pavement overlays; 7) pavement recycling.

Course learning objectives:

1. To familiarize the student with properties, specifications, and test methods for pavement subgrades, subbases, bases, and surface courses for flexible and rigid pavements.
2. To show how material selection, design decisions, and the construction process influence pavement stresses, strains, and durability which in turn control distress mode and severity for flexible and rigid pavements.
3. To expose the student to the American Association of State Highway and Transportation Officials (AASHTO), National Asphalt Pavement Association (NAPA), Asphalt Institute (AI), California Bearing Ratio (CBR), and typical sections methods of flexible pavement design
4. To expose the student to the AASHTO, Portland Cement Association (PCA), Tennessee Ready Mixed Concrete Association (TRMCA), ACI 330 and typical sections methods of rigid pavement design.
5. To introduce the students to the basic concepts of pavement management, pavement maintenance, and pavement recycling. The introduction will include five or more techniques for flexible and rigid pavement overlay design.

Major Topics Covered:

1. Materials for pavements;
2. Pavement distress;
3. Flexible pavement design;
4. Rigid pavement design;
5. Pavement preservation;
6. Design of pavement overlays;
7. Pavement recycling.

Measurable outcomes:

Students will be expected to:

1. Be able to discuss properties, specifications, and test methods for pavement subgrades, subbases, bases, and surface courses for flexible and rigid pavements.
2. Be able to identify pavement distress types and list probable causes. Further, the student will be able to calculate stresses and strains developed in flexible and rigid pavements and evaluate their effect on pavement performance.
3. Be able to design flexible pavements by the AASHTO, NAPA, AI, CBR, and typical sections methods.
4. Be able to design rigid pavements by the AASHTO, PCA, TRMCA, ACI 330 and typical sections methods.
5. Be able to design overlays for rigid and flexible pavements by several methods and be familiar with pavement management and pavement maintenance basic concepts.