

1. CEE 4610 (5610) – Pavement Design
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics (Significant Design)
3. Course coordinator: L. K. Crouch
4. Textbook: Yoder and Witczak, *Principles of Pavement Design*, Wiley, Second edition, 1975.

5. Course information:

2020 Catalog description	Structural design of flexible and rigid pavements. Pavement rehabilitation. Properties of subgrades, base courses and paving materials.
Prerequisite(s)	CEE 3610
Course type	Selected Elective

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Discuss properties, specifications, and test methods for pavement subgrades, subbases, bases, and surface courses for flexible and rigid pavements	1
CO2	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	1
CO3	Design flexible pavements by the AASHTO, NAPA, AI, CBR, and typical sections methods	1, 2
CO4	Design rigid pavements by the AASHTO, PCA, ACPA, and ACI 330 methods	1, 2
CO5	Design overlays for rigid and flexible pavements by several methods and be familiar with pavement management and pavement maintenance basic concepts	1, 2

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

7. Course topics:
 1. Background information (subgrades, subbases, bases, pavement distress, traffic and wheel loads (35%))
 2. Analysis and structural design of flexible pavements by the AASHTO, Asphalt Institute, NAPA, CBR, and typical sections methods (20%)
 3. Analysis and structural design of rigid pavements by the AASHTO, PCA, ACPA, and ACI 330 methods (25%)
 4. Analysis and structural design of pavement overlays (20%)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
 2. Analyze and solve problems in at least four technical areas appropriate to civil engineering
 3. Design a system, component, or process in at least two civil engineering contexts
 4. Include principles of sustainability in design
8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:
Additional work in the form of a term paper, presentation, computer modeling exercise or laboratory project on a subject chosen in consultation with the instructor will be required for graduate credit.
9. Date: 01/28/2020