1. **Course Name:** Theory of Pavement Design
2. **Credits:** 3
3. **Course No:** 521 EM5770 (Fall)
4. **Instructor:** Chia-Pei Chou
5. **Course Objective:**
   Pavement design theory is a subject for integrating the relationships among paving materials, loading, and the stress/ strain. The general concepts adapted for both highway and airport pavements are the same. The objectives of this course are to analyze the wheel loads and environmental loads on pavement through the various theoretical methods and to discuss the pavement behavior.

6. **Course Description:**
   (1) Concepts of Pavement Design
      a. Introduction
      b. Definition and System Failure
      c. Stochastic Analysis
   (2) Stress/ Strain due to Wheel Loads
   (3) Rigid Pavement Design Theory
      a. Plate Theory- Closed Form Solution
      b. Plate Theory- Opened Form Solution
      c. Plate Theory- Computer Solution
   (4) Flexible Pavement Design Theory
      a. Layered Theory- Background
      b. Layered Theory- Hand Solution
      c. Layered Theory- Computer Solution
   (5) Stress/ Strain due to Environmental Loads
      a. Volume Change Stresses in CRCP
      b. Volume Change Stresses in JRCP and JCP
      c. Volume Changes Stresses in ACP
      d. Warping and Curing Stresses in Concrete Pavement
   (6) Material Characteristics and Tests
      a. Theories
      b. Current Tests
      c. Resilient Modulus
      d. Fatigue

7. **Course Requirement:**
   (1) Homework 20%
   (2) Mid-term Exam 30%
   (3) Final Exam 30%
   (4) Reading Assignment 15%
   (5) Classroom Participation 5 %

8. **Textbook(s) or Reference(s):**
   (1) Pavement Analysis and Design, Yang Huang, 1993.
   (2) AASHTO 2002 M&E Design Guide
   (3) Principles of Pavement Design, 2nd Edition, Yoder & Witczak, John Wiley and Sons, Inc. 1975

(4) Pavement Analysis, per Ullidtz, Elsevier, 1987.
(5) AASHTO Guide for Design of Pavement Structure, 1993
(6) Reading Assignments

9. Level of study:
Graduates Students

10. Prerequisite(s):
Material Mechanics, Soil Mechanics