

## **COURSES IN THE CIVIL DEPARTMENT RELEVANT TO PAVEMENTS**

### **CEE 2333: INTRODUCTION TO FINITE ELEMENTS 3 cr.**

**(Cross-Listed with BIOENG 2333)**

Introduction to the finite element method and its application to various problems of elastic elements and structures. Both physical and variational approaches are used.

### **CEE 2340: CONCRETE STRUCTURES 2 3 cr.**

Advanced behavior, strength and design of reinforced concrete structures, including column and frame stability effects, two-way slabs, and serviceability criteria. Introduction to earthquake design concepts. **Prerequisite:** CEE 1340

### **CEE 2341: STEEL STRUCTURES 2 3 cr.**

Advanced design criteria for steel structures, including composite beams, columns, and frames; member and system stability; first- and second- order analysis of frames; and serviceability criteria. Introduction to concepts of plastic design. **Prerequisite:** CEE 1341

### **<sup>1</sup>CEE 2343: PRESTRESSED CONCRETE 3 cr.**

Design of prestressed concrete beams and slabs, including shear and torsion effects.

**Prerequisites:** CEE 1340 (2340 preferred).

### **CEE 2347: BRIDGE DESIGN 3cr.**

Design of highway bridge structures from conception through operation. Topics include steel and concrete design, bridge delivery, bridge maintenance and operation, bridge inspection and rehabilitation. **Prerequisites:** CEE 1340 and 1341 (2340 and 2341 preferred)

### **CEE 2814: SLOPES & EARTH RETAINING STRUCTURES 3 cr.**

Conventional methods and recent advances in slope stability analyses; classical and modern earth pressure theories; design of rigid and flexible retaining structures; earth dams, their design and stability. **Prerequisite:** CEE 1811

### **CEE 2800: ENGINEERING GEOLOGY 3 cr.**

Review of basic geologic principles with emphasis on the importance and influence of geology and geologic processes on engineering projects such as dam sites, foundations, tunnels, mine subsidence, landslides, highways, groundwater problems, and seismic studies.

### **CEE 2321: ELASTY, PLASTICITY FRAC MECHCS 3 cr.**

This course provides first-year graduate students with the fundamentals regarding mathematical derivations, mechanical models and numerical analyses in elasticity, plasticity and fracture mechanics. It is aimed at laying the foundations for the students for their future study and research in advanced mechanical problems.

### **CEE 3714: ADVANCD PAVEMENT DESIGN & ANAL 3 cr.**

Theoretical models for analysis of pavement systems. Design and analysis of pavements through the use of transfer functions relating pavement response to pavement performance. Evaluation of current pavement design practices and procedures. Economic evaluation of highway and airport pavements.

### **CEE 2714: PAVEMENT DESIGN AND ANALYSIS 3 cr.**

Concepts and principles in the structural design of pavements for highways and airfields including: traffic loads, climatic factors, soil and material characterization. Application of current

pavement design practices and procedures. Economic evaluation of highway and airport pavements.

### **CEE 2717: CMPNTS, PROPRTS & DSGN OF PCC 3 cr.**

Examines the influence of constituent materials (cements, aggregates and admixtures) on the properties of fresh and hardened concrete, mix design handling and placement of concrete; and behavior of concrete under various types of loading and environment; test methods, designing concrete mixes for specific applications.

### **CEE 2715: PAVEMENT MAINTENANCE AND REHAB 3 cr.**

Engineering concepts and information needed to maintain and rehabilitate pavements. Project evaluation, testing and analysis. Design of rigid and flexible overlays, and other methods of rehabilitation. Selection of rehabilitation alternatives. Analysis of the effects of maintenance activities on pavement performance. Initial and life cycle cost analysis of various rehabilitation alternatives.

## **COURSES IN OTHER DEPARTMENTS RELEVANT TO PAVEMENTS**

INFSCI 2595 MACHINE LEARNING

IE 2007 STATISTICS AND DATA ANALYSIS

ENGR 3100 ENGINEERING RESEARCH LEADERSHIP AND MANAGEMENT