REGULAR COURSE SYLLABUS

College of: Professional Studies

Department: Engineering and Engineering Technology

Prefix & Course Number: SSE 4300 Crosslisted With*: ___

Course Title: Probabilistic Design Methodology

Transcript Course Title (30 characters): Probabilistic Design Method

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

Federal Credit Hour Definition: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:
(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward to the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 3 (3+0) Schedule Type: L Grade Mode: L

Face-to-Face or Equivalent Hours per course:
Lecture 45 Lab ___ Internship ___ Practicum ___ Other (please specify type and hours): ___

Additional Student Work Hours per course: 90

Variable topics umbrella course: No X Yes ___ If yes, number of credits/repeats allowed ___

Specified repeatable course: No X Yes ___ If yes, number of credits/repeats allowed ___

Prerequisite(s): SSE 3135 with "C" or better or permission of instructor

Corequisite(s): ___

Prerequisite(s) or Corequisite(s):

APPROVED:

Department Chair OR Program Director Date

Dean OR Associate Dean Date

Associate VP, Academic and Student Affairs Date

*If crosslisted, attach completed Course Crosslisting Agreement Form
Prefix and Course Number: SSE 4300

Banner Enforced Coding:
Prerequisite(s): SSE 3135 with "C" or better
Corequisite(s): 
Prerequisite(s) or Corequisite(s):

Registration restrictions: Level ____ Class ____ Program/Major ____ Student attribute ____

Catalog Course Description:
In this course students study engineering design methods that account for the stochastic nature of the design variables and provide means to quantify the inherent risk of a design. The students are introduced to basic concepts of stochastics, followed by the evolution of the probabilistic design, after which the design methods are discussed with emphasis on the Monte Carlo simulation and its applications to structural analysis and design.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:

Recommended:

Specific, Measurable Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Compare different engineering design methods with respect to probabilistic design.
2. Apply Monte Carlo method to structural engineering problems.
3. Analyze design risks.

Detailed Outline of Course Content:
I. Stochastics Basics
   A. Probability Theory
   B. Stochastic Processes
   C. Statistics
II. History of Probabilistic Design
III. Design Methods
   A. Basic Approach
   B. Steps of Probabilistic Design
   C. Structural Reliability
      1. First-Order Reliability Method
      2. Monte-Carlo Simulation
         a. Accuracy and Number of Trials Required
         b. Generating Random Numbers
         c. Correlation of Variables
         d. Simulation and Efficiency
IV. Applications to Analysis and Design of Structural Systems

Evaluation of Student Performance:
1. Examinations
2. Assignments