Engineering Statistics

1. *Course number and name*
   0901401: Engineering Statistics

2. *Credits and contact hours*
   3 Credit Hours

3. *Instructor's or course coordinator's name*
   Instructor: Ramia Alajarmeh, Assistant Professor of Civil Engineering
   Course Coordinator: Ramia Alajarmeh, Assistant Professor of Civil Engineering

4. *Text book, title, author, and year*
   - Rudolf J. Freund, Donna Mohr, William J. Wilson 2010, "*Statistical Methods*", 3rd Edition, Academic Press
   - Douglas C. Montgomery 2013, "*Applied Statistics and Probability for Engineers*", 6th Edition, John Wiley & Sons

   a. *other supplemental materials*
   - Lectures' notes and handouts
   - Useful Web Links:
     http://home.ubalt.edu/ntsbarsh/Business-stat/opre504.htm
     http://iridl.ldeo.columbia.edu/dochelp/StatTutorial/
     http://stattrek.com/tutorials/free-online-courses.aspx

5. Specific course information
   a. *brief description of the content of the course (catalog description)*
   Descriptive statistics, discrete and continuous random variables and probability distributions, joint probability distributions, point and interval estimation, tests of hypothesis, correlation and regression, analysis of variance, time series.

   b. *prerequisites or co-requisites*
   Prerequisite: (0301102) Calculus (2)

   c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*
   Required for Civil Engineering

6. Specific goals for the course
   a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
   - The student will be able to differentiate between descriptive and inferential statistics.
   - The student will be able to describe samples using specific statistics measures and/or graphical presentation methods.
   - The student will be able to identify the random variable and produce empirical probability distributions (discrete and continuous).

- The student will be able to use the theoretical probability distributions (discrete and continuous) and related statistical tables.
- The student will be able to infer how likely it is that any statistics calculated from samples apply to the whole population.
- The student will be able to compute the linear regression model and interpret the strength of the linear association between explanatory and response variables.

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*
Course addresses ABET Student Outcome(s): 3a and 2k.

7. *Brief list of topics to be covered*
   - Introduction
     - o basic terminology
   - Descriptive Statistics
     - o measures of location and variability
     - o quartiles and percentiles
     - o outliers
     - o graphical presentation methods
   - Random variables and probability distributions
     - o introduction to probability,
     - o discrete random variables and discrete probability distributions
     - o continuous random variables and continuous probability distributions
   - Sampling distributions
     - o central limit theorem
     - o chi squared distribution
     - o t-distribution
     - o F-distribution
   - Estimation
     - o point and interval estimation
   - Tests of hypothesis
   - Analysis of Variance (ANOVA)
   - Linear regression and correlation
     - o linear regression
     - o correlation and Pearson's product-moment coefficient

8. *Course Time & Place*
   - Engineering Statistics [section (1) – Sun, Tue, Thu 08:00 am – 09:00 am]: CE107
   - Engineering Statistics [section (2) – Mon, Wed 11:00 am – 12:30 pm]: CE105

9. *Grading & Attendance*
   - Midterm exams (40%); Assignments (20%); and Final exam (40%)
   - Exams: Every student must do their work individually. Cheating will result in an F grade.
   - No Makeup exams.

- Attendance: Students are expected to attend EVERY CLASS SESSION and they are responsible for all material, announcements, schedule changes, etc., discussed in class. The university policy regarding the attendance will be strictly adhered to.