

University of Jordan
College of Engineering and Technology
Civil Engineering Department

1. **Course number and name:** (0941790) Statistics in Transportation Engineering
2. **Class schedule:** 3 credits
 - a. Time and place: Tue. 15:30-16:30 at CE 103
 - b. Office hours: Tue., Wed. 11:00 – 12:00
 - c. I will do every effort to be available during my scheduled office hours.
However, University duties may require that I sometimes miss these hours.
3. **Instructor:** Dr. Hana Naghawi
4. **Text book:** Statistical Methods, Freund and Wilson, 2nd Ed.
5. **Reference:** Montgomery, D., and Runger, G. Applied Statistics and Probability for Engineers, 4th edition, John Wiley & Sons, 2006. (ISBN-13: 9780471745891).
6. **Course information:**
2005-2006 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.
7. **Specific goals of the course:**
The main objective of this course is to provide a working understanding of the concepts and applications of statistics and the role it plays in engineering solving process.

8. **Topics covered:**

Week	Topics
1 & 2	- Introduction - Population, Samples, Statistical Inference - Data sources/presentation - Variables - Measures of Central Tendency - Measures of Dispersion
3 & 4	- Probability & Common Distributions. - Probabilities - Discrete Probability Distributions - Continuous Probability Distributions - Sampling Distributions
5	- Central Limit Theorem and Other Sampling Distributions
6 & 8	- Hypothesis Test - Confidence Intervals - Classical Hypothesis Testing Techniques - Observed Significance Level (p-value)
9 & 10	- Two-Group and Paired Experiments Using Confidence Intervals - Equality of 2 variances
11 & 12	- Two Group Experiments with Unequal Variances

- 13 - The Analysis of Variance (ANOVA)
- 13 - Interval Estimation, Testing Homogeneity of Variance and Multiple Comparisons
- 14 - Simple Linear Regression Analysis
- 15 - Review

9. Minimum student materials: Text book, class handouts, engineering calculator

10. Instructional methods:

- a. Lecture/Problem solving sessions.
- b. Case studies.
- c. Homework

11. Assignment Methods:

- a. Homework assignments will be required. Assignments are not to be handed in unless you are specifically instructed to do so.
- b. Unannounced quizzes will be given from time to time.
- c. Midterm exam/s will be used to determine the level of understanding of the methodology for solving problems, and the quantitative relations of important concepts.
- d. The final exam will be used to test the ability of students to synthesize related concepts from course topics, and to evaluate their capability of assimilation of course contents through quantitative problems and qualitative reasoning.

12. Student Learning Outcomes:

On successful completion of the course students will be able to:

- Use statistical models and statistical concepts including probability and hypothesis testing to solve engineering problems.
- Compute and interpret descriptive statistics using numerical and graphical techniques.
- Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution.
- Understand the basic concepts underlying hypothesis testing.
- Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem.
- Explain the underlying assumptions and the applicability of each of the approaches studied.
- Construct confidence intervals on parameters for a single sample.
- Demonstrate an enhanced analytical ability.

13. Grading Policy:

Short project/exam/Quizzes	:	30%
Midterm Exam	:	30%
<u>Final exam</u>	:	<u>40%</u>
Total	:	100%

14. Important Dates

- Short Exam
- Midterm Exam

15. Course Policies

All cellular phones must be turned off before class begins. Eating and/or drinking is not allowed in the classroom. Talking to a fellow student while the lecture is in progress will not be tolerated. You will be asked to leave the class if this behavior is disruptive. For any behavior, points may be deducted from your exam grade(s). The number of points deducted is left to the instructor's discretion. As required by the University, cases of academic dishonesty will be handled through the proper channels.