

This course is available for student registration only after the approval process has been completed.

SUBJECT EST COURSE NO. 2703 CREDIT HOURS 3 TERM TO BE ADDED TO THE FILE Spring 2008
Alpha Prefix (e.g., CSE) Number Choice (e.g., 1301) (e.g., Fall 2006)

CLASS HOURS 45 LECTURE HOURS 45 LAB HOURS _____ CONTACT HOURS (CEU ONLY) _____

DEPARTMENT University College SCHEDULE TYPE virtual classroom
(e.g., Computer Sciences) (e.g., Lecture, Lab or Special Project)

- COLLEGE OF AERONAUTICS-23 COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS-25
 COLLEGE OF BUSINESS-24 COLLEGE OF SCIENCE-26
 COLLEGE OF ENGINEERING-01 UNIVERSITY COLLEGE EXTENDED STUDIES-27

COMPUTER TITLE Restricted to 25 characters, including spaces Statistics

CATALOG TITLE Statistics

CATALOG DESCRIPTION OF COURSE Limited to 350 characters, including spaces

STATISTICS: An elementary statistics course with emphasis on mathematical concepts. Topics include measures of central tendency and spread, probability, binomial, normal, and t distributions, statistical inference, and linear regression and correlation.

In addition, you may attach a course syllabus and/or more detailed description.

RESTRICTIONS: Prerequisite MTH 1000 or higher Corequisite _____
Course Number Course Number

Prerequisite _____ Corequisite _____
Course Number Course Number

Prerequisite _____ Corequisite _____
Course Number Course Number

GRADES TO BE ISSUED

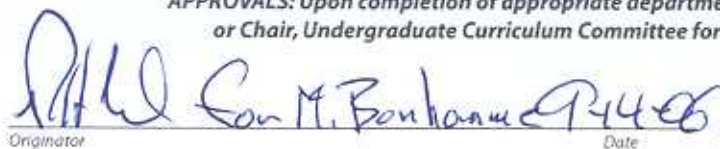
- A, B, C, D, F
 A, B, C, D, F, CEU
 CEU
 S, U
 P, F
 Other _____

ADDITIONAL RESTRICTION _____
(e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information

SUBJECT Alpha Prefix (e.g., CSE) _____ COURSE NO. (e.g., 1301) _____

APPROVALS: Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.


 Originator _____ Date _____

Chair, Graduate Council _____ Date _____

Department Head/Program Chair _____

OR

Dean or Associate Dean _____ Date _____

Chair, Undergraduate Curriculum Committee _____ Date _____

CATALOG DIRECTOR

These changes/additions have been made for the _____
 University/Extended Studies Catalog and entered into the
 BANNER term named above.

Catalog Director _____ Date _____

REGISTRAR'S USE ONLY

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EST 2703: Statistics

Course Description

An elementary statistics course with emphasis on mathematical concepts. Topics include measures of central tendency and spread, probability, binomial, normal, and t distributions, statistical inference, and linear regression and correlation.

Course Objectives

Analysts and economic policy-makers use statistical tools to summarize, present and evaluate qualitative and quantitative information, with the goal of solving problems and making informed decisions. They do so because statistics offers a meaningful way to draw useful conclusions from real world behavioral observations. This course provides lots of hands-on experience applying statistical tools to problem-solving situations. By the end of this course you should be able to 1) present and interpret statistical data using charts and graphs; 2) identify and work with specific probability and sampling distributions 3) formulate and test hypotheses; and 4) test hypotheses and predict outcomes using regression analysis.

Learning Objectives

- Enhance Critical Thinking Skills
 - Ability to interpret statistical output
 - Ability to use statistical analysis to make business decisions
 - Ability to match appropriate statistical tool with problem
- Enhance Technical Skills
 - Working with Secondary Data Sources
 - Generating Statistical Output using Excel and/or SPSS
- Foster Ethical Practices
 - Detecting Fraud, Absenteeism and Discrimination
 - Abuses: data mining, ignoring negative information, fitting results to a pre-determined conclusion

Course Resources and Prerequisites

- **Required textbook:** David S. Moore, George P. McCabe, William M. Duckworth, and Stanley, L. Sclove, *The Practice of Business Statistics: Using Data for Decisions*, 1st Edition, W. H. Freeman and Company, 2003. ISBN 0-7167-9773-9
- **Blackboard:** enroll at <http://fit.blackboard.com>; EST 2703: Statistics. You will find announcements, answer keys, and PowerPoint slides on Blackboard.
- **Calculator:** nothing fancy (Texas Instruments TI-30X IIS); bring to each class
- **Excel and/or SPSS:**
- **Prerequisite:** MTH 1000 or higher

Grading and Assessment

- Module Exams (3) 50% (two high scores: 20% each; low score: 10%)
- Module 4 Exam 30%
- Mini-tests (5) 20% (drop low score)
- Intangibles 2%

Examinations and Mini-tests

- Short answer exams and mini-tests will be given periodically throughout the semester. Mini-tests will last for 30 minutes and should be used as a device to identify concepts that require additional study and to correct minor mistakes in logic and/or process. The best way to study for exams and mini-tests is to work the assigned problems from the textbook.
- A student may be given a [make-up exam](#) provided he/she notifies the instructor *prior* to the test date (for university sponsored events notification must occur one month prior to the exam) and at the appropriate time offers the instructor a *signed medical notice*. The exam must be taken *within* a time frame defined by the instructor.
- A missed exam or mini-test, without a verifiable administrative or medical excuse, will be scored as a zero in my grade book. There will be **NO MAKE-UP for a missed mini-test**. In order to avoid penalizing someone who fails to attend a mini-test because of a university sponsored event, medical emergency or unforeseen special situation I will drop your lowest quiz score.
- The public posting of grades either by student name, institutional student number or social security number without the student's written permission is a violation of the Federal Family Educational Rights and Privacy Act. Further, student grades may not be forwarded via e-mail (even in response to the student's request).

Intangibles Grade

The "intangibles" category effectively adds bonus points to your total score, and is intended to cultivate desirable habits and traits employers expect in the work place. Students can **earn** up to 100 points, which will then be converted using a 2% weight. You can earn points in the following categories.

- Punctuality and Virtual Class-room Decorum (up to 20 points, subjective)
- Active Participation during problem solving exercises (up to 40 points; subjective)

Attendance

Unexcused absences will be recorded in my grade book. A student who exceeds THREE unexcused absences will automatically receive **zero for the intangibles grade**. An **excused absence** will be granted for University sponsored events, medical emergencies and special situations as long as you can provide verifiable documented evidence to support your claim. ***Students who attend class to write a mini-test but then skip the remainder of the class will be marked absent.***

ADA Accommodations

Please contact Rodney Bowers, Director, Academic Support Center, 321-674-7110, rbowers@fit.edu with any specific ADA accommodations you may require as you work to meet the course requirements.

Course Outline

(Subject to revision at the discretion of the instructor)

Module 1: Descriptive Statistics

1. Displaying Distributions with Graphs

Reading: section 1.1

- a. Histograms
 - i. shape, center, spread, outliers
 - ii. interpreting histograms
 - iii. constructing a histogram from scratch
- b. Creating Histograms and Frequency Distributions Using Excel
- c. Other Charts
 - i. bar graphs and pie charts
 - ii. time plots

2. Describing Distributions with Numbers

Reading: section 1.2 and 1.3

- a. Describing the Center and Spread
 - i. Mean and standard deviation
 - ii. Median, range, inter-quartile range
- b. Mini-Test 1**
- c. Describing the Position and Distance of an Observation
 - i. Percentile
 - ii. Z-score
- d. Shape of a Distribution
 - i. Normal Distribution
 - ii. Histogram
 - iii. Box-Plot

3. Examining Relationships: Numerical Data

Reading: section 2.1, 2.2, 2.3, 2.4

- a. form, direction, strength
 - i. scatterplots
 - ii. correlation coefficient and R^2
- b. prediction
 - i. regression line
 - ii. outliers, influential observations
- c. cautions about correlation and regression

Module 2: Probability and Sampling Distributions

4. Preliminary Concepts

Reading: section 3.1, 4.1, and 2.5

- a. Mini-Test 2**
- b. The idea of probability (coin toss simulation)
- c. Simple Random Sampling
- d. Contingency Tables – a first look

5. General Probability Rules

Reading: 4.2, 5.1 and 5.4

- a. **Module 1 Examination**
- b. General Probability Rules
- c. Conditional Probability and Probability Trees

6. Introduction to Sampling Distributions

Reading: section 3.3 and 4.4,

- a. The idea of sampling distributions
- b. The sampling distribution of a sample mean

7. Working with Core Probability Distributions

Reading: section 5.2 and 5.3

- a. Binomial distribution
- b. Poisson Distribution

Module 3: Basic Inferential Techniques

8. Confidence Intervals

Reading: section 6.1

- a. **Mini-Test 3**
- b. Interval estimates in general
 - i. Replication and confidence
 - ii. Point Estimate
 - iii. Margin of Error
- c. Interval estimates for a population mean
- d. Practice problems

9. An Introduction to Tests of Significance

Reading: section 6.2, 6.3

- a. **Module 2 Examination**
- b. Research hypothesis and Null hypothesis
- c. Statistical evidence using test-statistics
- d. Assessing statistical significance using P-values
- e. Statistical significance vs. practical significance

10. Inference for the Mean: One Population

Reading: section 7.1 and 6.4

- a. One-sided alternative
- b. Two-sided alternative
- c. Problems
- d. Power

11. Inference for the Proportion: One Population
Reading: section 8.1

- a. **Mini-Test 4**
- b. One-sided alternatives
- c. Two-sided alternatives
- d. Problems

Module 4: Advanced Inferential Techniques

12. Comparative Experiments
Reading: section 3.2

- a. **Module 3 Examination**
- b. Comparative Design Experiments
 - i. Completely randomized experiment
 - ii. Matched pair design
 - iii. Block design

13. Multiple Population Models
Reading: section 9.1, 9.2, and online material

- a. Chi-Square Tests
- b. One-Way ANOVA

14. Regression Analysis
Reading: 2.3, 10.1, 11.1 and 11.2

- a. **Mini-Test 5**
- b. Regression Review
- c. Inference about the regression slope
- d. Multiple Regression
 - i. Regression equation and slope coefficient interpretation
 - ii. Regression equation and prediction
 - iii. Inference about the coefficient values

15. Model Building and Abuses in Statistics
Reading: section 11.3 and on-line material

- a. Model Building with Multiple Regression
- b. Abuses in Statistics

16. Module 4 Examination