

USC Marshall Executive MBA Program-Los Angeles

Managerial Statistics Syllabus and Schedule

Sessions (see schedule): Theme 1; Theme 2 on Fridays and Saturdays

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We will cover the basic tools and concepts of empirical analysis: descriptive statistics, exploratory data analysis, statistical relationships (including regression and correlation), causation, sampling, and statistical inference (including significance tests and confidence intervals). In this context we will use a variety of statistical methods to analyze data. The concepts in statistics reappear in other EMBA themes particularly those emphasizing economics, finance, operations and marketing. It will be worth your effort to understand the statistical concepts and methods from this module.

Prerequisites

You should be familiar with algebra at the pre-calculus level. Some computer literacy is necessary; you should have access to and feel comfortable running a Windows, Macintosh or Linux operating system (pointing, dragging, clicking etc.). In addition, you should be familiar with elementary probability concepts. See the slides for the optional statistics pre-sessions for details.

You will be using your own computer to plot and analyze data. We will introduce you to statistical techniques that are available in Excel, but there are some instances in which we will use a different software program called Minitab. Minitab resembles a spreadsheet in some ways but has many specialized analytical and graphical features that we will use that are not found in Excel and its cousins. Our use of Minitab will be mainly in the second half of the course, in the Regression Analysis sessions. There are a few options for acquiring the use of Minitab:

1. Purchase a full version from www.minitab.com. Remember that you're a student now, so you can take advantage of the academic pricing.
2. Rent a version of Minitab from www.minitab.com for a fixed amount of time.
3. Access the software through the mymarshall.usc.edu website under the Services – Marshall Virtual Lab option (if you are using a Mac, you will have to choose this option because Minitab is currently only available to PC users).
4. Download a free 30-day trial version of the software, again at www.minitab.com. If you choose this option, you should wait to do this until we are discussing the Regression topics.

Course Materials

Stine & Foster, 2011, *Statistics for Business: Decision Making and Analysis*, 2nd ed, Pearson Publishing (S&F).

In preparing for each class, your *first* priority should be to read the annotated PowerPoint slides for that session. These are in your binders and are posted electronically. The syllabus and schedule below list the readings in each of the source materials corresponding to each class session. The S&F text should be used as a reference and a source of problems to work to insure that you understand the concepts and methods. The data sets used in class and for assignments will also be posted electronically.

Course Grades

All EMBA themes have a target average grade of 3.4 (on a 4-point scale). The final grade in the Managerial Statistics module will have three components: your two group homework assignments, two in-class quizzes, and your group regression project

1. Assignments (30%). For the assignments, you may hand them in as group work. *Homework groups may have as many participants as you want, but the Final Project is limited to 5.* You may turn in one assignment for an entire study group. Assignments should be done carefully and handed in with the solution printed. Assignments will be posted electronically. The data for the assignments, project, and classroom examples may be downloaded. The two assignments count 15% each. Solutions will be issued after the assignments are turned in. Since late assignments delay when solutions can be issued, please do not ask to turn in assignments late. The TA will grade assignments. Any requests for changes in assignment grades due to grading errors must be made within two weeks of when the assignments are returned.

2. Quizzes (40%). There will be two multiple choice/short answer quiz. Attached to these quizzes will be a “formula sheet” containing all the equations and formulas necessary for the course up to that point. Practice quizzes in the same format and content will be posted in advance of the quizzes.

3. Group Multiple Regression Project (30%). You will be required to carry out a *group* class project, with a *maximum of 5 people per group*. You will need to use *Minitab* to carry out the analysis for this project. You will be responsible for obtaining your own data for the project, but I will post suggested websites and sources for various types of datasets in case you need them. Details on format, content and grading will be distributed separately.

Schedule for Theme 1

#	Topic	Reading
1	<i>Descriptive Statistics</i> Numerical Summaries Graphical Displays	S&F, Chs 1.1 – 1.2, 2.2, 3, 4, 6.1
2	<i>Probability & Random Variables</i> Expected Value & Standard Deviation Discrete Distributions	S&F, Chs 3, 4, 6.1, 9

Schedule for Theme 2

#	Date	Topic	Reading	Due
3 & 4	9/5	<i>Normal Distribution</i> <i>Sampling Distributions & Confidence Intervals</i>	S&F, Chs 9, 10.1, 10.2, 10.4, 12 S&F, Chaps 13.1, 13.2, 14.1, 15	
5 & 6	9/6	<i>Hypothesis Testing</i> Significance Tests for a Mean <i>Simple Linear Regression</i> I: Fitting a Straight Line to Data	S&F, Chs 14.1, 15 S&F, Chs 19, 21	Asst 1
7 & 8	9/19	<i>Simple Linear Regression</i> II: Confidence/Prediction Intervals <i>Multiple Regression</i> I: Basics & Collinearity	S&F, Chs 21, 23 S&F, Chs 23, 24, 25	Quiz 1
9 & 10	9/20	<i>Multiple Regression</i> II: Residuals & Outliers III: Binary Xs	S&F, Chs 23, 24, 25	
	10/18	Submit Assignment 2 electronically		Asst 2
11 & 12	10/31	<i>Multiple Regression</i> IV: Xs with several categories V: Model Selection Strategy	S&F, Chs 22, 25	Quiz 2
13 & 14	11/1	<i>Project Discussion</i> <i>Multiple Regression</i> VI: Modeling a Categorical Choice VII: Time Series (if time allows)	S&F, Chs 22, 25	
	11/15	Submit Group Project electronically		Project