MGB-203B – Forecasting & Managerial Research Methods

PREREQUISITE: MGB/P/T 203A – Data Analysis for Managers

TERM: Summer 2016

LECTURES: Friday: 6:00 p.m. – 9:00 p.m. & Saturday: 1:00 p.m. – 4:00 p.m.
Bishop Ranch - Room BR-1502
June 17, 18, July 1, 2, 15, 16, 29, 30, August 12, 13
August 27 (Final)

INSTRUCTOR: Mehul Rangwala
916.395.2841
mrangwala@ucdavis.edu

OFFICE HOURS: In-person – Saturdays: 4:00 p.m. – 6:00 p.m.
I encourage you to use this time to ask questions or review any part of the material/homework you are having difficulty with. If this time is not convenient, then a separate appointment can be arranged for a meeting either in-person or over the phone.

On the phone – any weekday evenings with prior appointment.

I'm pretty approachable so, even outside office hours, please feel free to contact me any time if you have any questions.

TEXT AND OTHER RESOURCES:

1. *Statistics for Management and Economics, 10th Edition* by Gerald Keller, Cengage Learning.
ISBN-13: 9781285425450, ISBN-10: 1285425456
If you use the Ninth edition, then please carefully verify its contents to those given in the Tenth edition.

2. Prof. Tsai's notes for the 203B course from the UC Davis bookstore. (During the quarter, if you have any questions about the topics/contents on these notes, please contact me.)

MATERIAL TO BE COVERED: Chapters 14 – 22 (see the pages 4 and 5 for details)

NOTES AND HANDOUTS: They will be made available on SmartSite a few days before every class. It is your responsibility to download the material/exercise files **prior to the start** of each class.

COMPUTER PACKAGE: Microsoft Excel and Minitab. You can rent Minitab (version 17) from http://www.onthehub.com/minitab/
You will also need to install the *Data Analysis Plus* Excel add-in from the author's website http://www.kellerstatistics.com/KellerStatistics/DataAnalysisPlus

PEDAGOGICAL APPROACH: The class sessions will be interactive with lectures, discussions, and hands-on exercises. We will work on cases and exercises related to the concepts being covered in each class session. A laptop with Excel, Minitab, and *Data Analysis Plus* installed is required.

GRADING:

Homework	30%
Team Assignment	20%
Midterm (take-home)	20%
Final Exam (in-class)	30%

Course Objectives:

1. Gain an appreciation for the breadth of statistical topics available to solve complex business problems.

2. Learn to identify correct statistical methods appropriate for business problems under consideration. Interpret the results and convey the interpretations in a non-technical manner to your audience.

3. Learn to use statistical software (Minitab and *Data Analysis Plus*) for computations.

4. Be able to critically evaluate reports/articles/research containing statistical information.

Additional Points and Suggestions:

1. While there will be some focus on mathematical formulas, a significant proportion of time will be spent on intuition behind statistical techniques, analyzing *when* a particular technique should be used, and interpreting/understanding the results from the computer outputs. It is not uncommon for business managers to misapply statistical techniques to research problems. So, it is very important to be able to identify and choose correct methods to solve research problem under study.

2. Please read the assigned chapters/topics prior to the class. After the class, re-read the chapter and the class notes. Summarize what you have learned. I will be assigning several practice problems (separate from homework problems) which will be ungraded. These are purely for

your practice and for deepening your understanding of the material and will not be graded. However, the assigned homework problems must be turned in by the due date for credit.

3. If you have any difficulty with any material, please don't hesitate to contact me. My topmost priority is to ensure that you are successful in understanding of the material.

4. The formats of the midterm and final exams may be varied. Please note that the purpose of the exams is to test your understanding of the concepts and not to test your ability to mechanically select menus and options in Minitab and Excel.

5. Real learning has happened when you can explain the statistical concepts in your own words to people who don't understand statistics.

6. The team assignment will be cases drawn from various business situations. You will be required to perform quantitative and qualitative analyses for these cases.

Schedule on the next page

Schedule (Tentative)

This is a tentative schedule. It may be adjusted according to the pace of the class.

	Date	Assignments Due	Topics Covered
1	Fri, June 17, 2016		Chapter 12 – Section 12.1 Review Chapter 13 – Sections 13.1 and 13.3 Review Chapter 14 – Analysis of Variance • One-Way Analysis of Variance • Multiple Comparisons
2	Sat, June 18, 2016		Chapter 14 – Analysis of Variance (contd.) • Randomized Block Design • Two-Factor Analysis of Variance Chapter 15 – Chi-Squared Tests • Chi-Squared Goodness-Of-Fit Test • Chi-Squared Test of a Contingency Table
3	Friday, July 1, 2016	Homework 1	Chapter 16 – Simple Linear Regression and Correlation • Model building • Estimating and interpreting coefficients • Model fitting • Regression Diagnostics 1 • Point and Interval Prediction
4	Saturday, July 2, 2016		Chapter 17 – Multiple Regression • Model building • Estimating and interpreting coefficients • Regression Diagnostics (Multicollinearity and Durbin-Watson test)
5	Friday, July 15, 2016	Homework 2	Chapter 18 – Model Building • Polynomial regression and nonlinear regression models • Regression models with interaction • Dummy variables
6	Saturday, July 16, 2016	Midterm Exam	Chapter 18 – Model Building • Variable Selection (Stepwise Regression) • Model Building Chapter 19 – Nonparametric Statistics • Wilcoxon Signed Rank and Rank Sum tests

	Date	**Assignments Due**	**Topics Covered**
			• Kruskal-Wallis test for completely randomized design • Friedman test for randomized block design
7	Friday, July 29, 2016	Homework 3	Chapter 19 – Nonparametric Statistics • Spearman Rank Correlation Chapter 20 – Time-Series Analysis and Forecasting • Time-Series Components • Smoothing Techniques
8	Saturday, July 30, 2016		Chapter 20 – Time-Series Analysis and Forecasting • Trend and Seasonal Effects • Introduction to Forecasting • Forecasting Models
9	Friday, August 12, 2016	Team Assignment	Chapter 21 – Statistical Process Control
10	Saturday, August 13, 2016		Chapter 22 – Decision Analysis
11	Saturday, August 27, 2016	Final Exam	