MGP-203B – Forecasting & Managerial Research Methods

PREREQUISITE: MGB/P/T 203A – Data Analysis for Managers
TERM: Winter Quarter 2022

LECTURES: Even Saturdays 1/15, 1/29, 2/12, 2/26, 3/12
Final Exam 3/19

INSTRUCTOR: Mehul Rangwala
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OFFICE HOURS: Will be posted on Canvas site.
I will stay back after every class if you want to meet me in person.

TEXTBOOK: *Statistics for Management and Economics, 11th Edition* by Gerald Keller, Cengage Learning.
ISBN-13: 9781337296946, ISBN-10: 1337296945

NOTES AND HANDOUTS: I will upload the notes, data sets, and in-class exercises on Canvas before every class.

Throughout the quarter I will be posting detailed notes and solved examples on the topics covered in the class. In the past, students have found them very helpful when working on the exams and homework.

COMPUTER PACKAGE: Minitab. You can rent Minitab from
http://www.onthehub.com/minitab/
No prior experience with Minitab is required. You will learn it through in-class exercises and homework assignments. It is a quite intuitive and easy to use. No programming is needed.

PEDAGOGICAL APPROACH: The class sessions will be interactive with lectures, discussions, and hands-on exercises using Minitab. After I introduce a topic, we will work on cases and exercises related to the concepts covered in each class session to reinforce the theory. A laptop with Excel and Minitab installed is required.

GRADING:

Homework (**Group**)	40%
Midterm (**take-home**)	30%
Final Exam (**in-class**)	30%

Course Objectives:

1. Build a foundation for big data and analytics.

2. Prepare you for other analytics-related courses in the MBA program.

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

4. 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.

5. Learn to use statistical software (Minitab) for computations.

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

Additional Points and Suggestions:

1. The course 203A takes you from fundamental principles through basics of regression analysis. This course (203B) closes the loop by covering ANOVA, regression analysis, time-series analysis, and statistical process control. I will spend the first few minutes of the first lecture reviewing some key concepts from the 203A so that we smoothly transition to 203B.

2. 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.

3. 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.

4. If you have 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.
5. 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.

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

7. The group homework, midterm, and the final 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. Contents and sequence may be adjusted according to the pace of the class.

	Date	Assignments Due	Topics Covered
1	Sat, Jan 15 (AM Session)		Review • Overview of Inferential Statistics • Inference About Population Mean--Standard Deviation Unknown • Inference About Difference Between Two Means--Independent Samples Analysis of Variance • One-Way Analysis of Variance • Multiple Comparisons
2	Sat, Jan 15 (PM Session)		Analysis of Variance (contd.) • Randomized Block Design • Two-Factor Analysis of Variance Nonparametric Tests • Wilcoxon-Rank Sum Test • Kruskal-Wallis Test • Friedman Test
3	Sat, Jan 29 (AM Session)	Homework 1 (Group)	Simple Linear Regression and Correlation • Model building • Estimating and interpreting coefficients • Model fitting • Regression Diagnostics 1 • Point and Interval Prediction
4	Sat, Jan 29 (PM Session)		Multiple Regression • Model building • Estimating and interpreting coefficients • Regression Diagnostics (Multicollinearity and Durbin-Watson test)
5	Sat, Feb 12 (AM Session)	Homework 2 (Group)	Model Building • Polynomial regression and nonlinear regression models • Regression models with interaction • Dummy variables

	Date	**Assignments Due**	**Topics Covered**
6	Sat, Feb 12 (PM Session)		Model Building • Variable Selection (Stepwise Regression) • Model Building Chi-Squared Tests • Chi-Squared Goodness-Of-Fit Test • Chi-Squared Test of a Contingency Table Nonparametric Statistics • Spearman Rank Correlation
7	Sat, Feb 26 (AM Session)	Midterm Exam (Take-Home - will be posted after the class on Feb 12. Complete and submit by Feb 26.)	Time-Series Analysis and Forecasting • Time-Series Components • Smoothing Techniques
8	Sat, Feb 26 (PM Session)		Time-Series Analysis and Forecasting • Trend and Seasonal Effects • Introduction to Forecasting • Forecasting Models
9	Sat, Mar 12 (AM Session)	Homework 3 (Group)	Statistical Process Control
10	Sat, Mar 12 (PM Session)		Statistical Process Control (Continued)
11	Sat, Mar 19 (From 1:00 – 4:00 PM)	Final Exam	In-class. It will include topics after the midterm.