# MBA Program – Fall 2022

## MGMT 504 – Fundamentals of Data Driven Business Decisions

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### COURSE OBJECTIVE:

This course covers basic and some intermediate statistics topics to teach students how to apply statistical analysis to managerial decisions. By requiring hands-on statistical analysis using MS Excel, the course also emphasizes development of the students' data analysis skills.

### LEARNING OUTCOMES:

Upon successful completion of the course, students should be able to:

1. Formulate statistical hypothesis and interpret hypothesis tests.
2. Perform descriptive analysis (using summary measures and charts) of data and interpret the results
3. Discuss the suitability of a linear regression model for a given managerial objective
4. Use statistical results of the linear regression model to check the model structure and how good the model is.

### INSTRUCTIONAL DESIGN:

The course focuses on formulating, solving and interpreting statistical analysis rather than memorization of formulas and inattentive application of methodology. Students are required to attend the classes with their laptop computers as all examples, in-class exercises and assignments are done using Microsoft Excel. Students can use both Windows and Mac versions of Excel. We will use Excel's functions and "Analysis Toolpak" add-in, which comes pre-installed with Excel for Windows and Excel for Mac 2016.

### READINGS:

The following readings are going to be made available through the Harvard Business School Publishing (HBSP) web site. These readings not only support the topics covered in class but also complement them, thus for maximum benefit from the course, students should read them carefully.

| Title | HBSP Number | Excel File | # Pages |
|---|---|---|---|
| A Refresher on Randomized Controlled Experiments | H02ROB-PDF-ENG | | 8 |
| A Refresher on Statistical Significance | H02NMS-PDF-ENG | | 10 |
| A Refresher on A/B Testing | H03R3D-PDF-ENG | | |
| Descriptive Statistics in Microsoft Excel | W16411-PDF-ENG | W16412-XLS-ENG | 13 |
| Histograms and the Normal Distribution in Microsoft Excel | W16413-PDF-ENG | W16414-XLS-ENG | 28 |
| PivotTables in Excel 2010 | IES378-PDF-ENG | XLS913-XLS-ENG | 20 |
| Sampling | UV6208-PDF-ENG | --- | 20 |
| Article: The Subtle Sources of Sampling Bias Hiding in Your Data | SMR621-PDF-ENG | --- | 4 |
| Linear Regression: A High-Level Overview | W17044-PDF-ENG | --- | 5 |
| Regression: Forecasting Using Explanatory Factors | UV1299-PDF-ENG | --- | 51 |
| Multiple Regression and Marketing-Mix Models | UV6764-PDF-ENG | --- | 10 |
| Practical Regression: Log vs. Linear Specification | KEL641-PDF-ENG | --- | 13 |
| From Correlation to Causation | 616009-PDF-ENG | --- | 7 |

**COURSE WEB:**

SUCourse+ will be used as the course's web site, where students will have access to all course related documents. Course slides, excel files, recordings of online lectures, grades will be posted on this web site. Assignments and in-classes exercises will be distributed through the "assignments" page of the site. Students will be expected to submit their solutions through this page.

**REQUIREMENTS**

There are four main requirements of the course. In-class exercises, individual assignments, a team assignment, and a final examination.

During the in-class exercises students will be able to receive help from each other since these are not meant to be quizzes. Their main purpose is to provide feedback to both the students and the professor during the lecture and facilitate learning by doing. 10% of the exercises with the lowest grade (or missed) will be dropped from grade calculation.

There will be individual assignments. Students will be expected to carry out the required work individually. To clarify this point, the students can talk to each other about how they tackle the assignments, but they should work on it individually. Since all these assignments are going to be delivered as a MS Excel or a MS Word file, students should not give their own files to others. It is very tempting for the receiving student to submit that file as his/her own and that would clearly be cheating; in that case both students would be held responsible not just the receiving one. If you want to help a fellow student, discuss your approach to the problem but do not give your file.

Team assignment will for teams with 2 students (at most 3 if the total number of students is odd).  It will be a case study requiring a managerial decision that requires statistical analysis. You do not have to be in the same team for all team assignments.

Final exam is going to be a sit-in exam that covers all the topics. Students will work on the problems using Excel on their laptop computers (without any internet access).

## GRADING

| | |
|---|---|
| In-class exercises | : 40% |
| Final examination | : 30% |
| Individual homework assignments | : 20% |
| Team assignment (case study) | : 10% |

## CLASSROOM POLICIES AND CONDUCT

Sabancı Business School value participatory learning. Establishing the necessary social order for a participatory learning environment requires that we all:

- Show respect for diversity, which can refer to multiple ways that we identify ourselves, including but not limited to race, color, national origin, language, sex, disability, age, sexual orientation, gender identity, religion, creed, ancestry, or beliefs.
- Come prepared to make helpful comments and ask questions that facilitate your own understanding and that of your classmates. This requires that you complete the assignments for each session and review the previous lecture before class starts.
- Come to class on time.
- Use your laptops during class only for class activities such as taking notes or working on Excel for an example or exercise.
- Do not let e-mails and other messaging services distract you and others.
- Participate in discussions in an active and meaningful manner while respecting the appropriate participation of other students.
- Provide me feedback along the way.

## ACADEMIC HONESTY:

Learning is enhanced through cooperation and as such you are encouraged to work in groups, ask for and give help freely in all appropriate settings. At the same time, as a matter of personal integrity, you should only represent your own work as yours. Any work that is submitted to be evaluated in this class should be an original piece of writing, presenting your ideas in your own words. Everything you borrow from books, articles, or web sites (including those in the syllabus) should be properly cited. Although you are encouraged to discuss your ideas with others (including your friends in the class), it is important that you do not share your writing (slides, MS Excel files, reports, etc.) with anyone. Using ideas, text and other intellectual property developed by someone else while claiming it is your original work is *plagiarism*.  Copying from others or providing answers or information, written or oral, to others is *cheating*.  Unauthorized help from another person or having someone else write one's paper or assignment is *collusion*. Cheating, plagiarism and collusion are serious offenses that could result in an F grade and disciplinary action. Please pay utmost attention to avoid such accusations.

**COURSE SCHEDULE:**

| 3-hour Session | Date | Content |
|---|---|---|
| 1 | Oct. 4 | • Introduction to course<br>• Descriptive statistics – charts |
| 2 | Oct. 11 | • Descriptive statistics – summary measures |
| 3 | Oct. 18 | • Intro to probability distributions |
| 4 | Oct. 25 | • Normal distribution<br>• Distribution of the sample mean |
| 5 | Nov. 1 | • Hypothesis testing and statistical significance |
| 6 | Nov. 8 | • Linear regression |
| 7 | Nov. 15 | • Linear regression |
|  | Nov. 22 | EXAM (1:40-3:30) |