הפקולטה לניהול
ע"ש קולר
אוניברסיטת תל אביב

Coller School
of Management
Tel Aviv University

Sofaer Global MBA

Data-Driven Business Thinking

Prerequisites: Statistics for Business & Market Research

Module 4 – 2022

Course Section Details

Day	Hour
April 24th, 2022	13.00-15.45
May 1st, 2022	13.00-15.45
May 8th, 2022	13.00-15.45
May 15th, 2022	13.00-15.45
May 22nd, 2022	13.00-15.45
May 29th, 2022	13.00-15.45
June 12th, 2022	13.00-15.45

Lecturer: Dr. Shachar Reichman, sr@tauex.tau.ac.il
Office hours: by appointment
TA: Guy Kern guykern@mail.tau.ac.il

Course Description

In the digital era, commercial, consumer, and social processes are carried out on a broad scope in a digital environment. Operational and managerial systems, along with Internet websites and cellular devices, enable routine collection of data concerning all activities performed in this environment. The ability to combine information concerning the consumer allows companies to build a complete picture of the consumption journey, from understanding the consumer's preferences, through analyzing business activities, to the consumption decision-making.

In spite of the richness of data collected, the ability to leverage advanced data analysis is not optimally utilized by companies to make decisions and achieve a significant business contribution.

The goal of the course is to develop data-driven business thinking through an understanding of the tools and technologies that allow firms to address the business questions and challenges in the digital era. The course deals with data-driven business solutions and focuses on data mining methods and their applications using real-world cases. Students will learn data analytics methodologies with big data analytics tools (Microsoft Azure ML). During the course, we will review examples of data challenges from various domains and discuss the uses of data analytics to support managerial decisions.

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Course Site (Moodle)

Upon completion of the course, the student will:

- understand the data-driven decision (DDD) process and it's managerial applications.
- learn the data analytics process.
- become familiar with online data sources and business data sources.
- learn predictive analytic models.
- and understand how to apply predictive analytics to business challenges.

Course Outline

#	Topics	Assignments
1	Data-Driven Decision (DDD) Making	
2	Data – Challenges and Opportunities a. Online data sources b. Data handling and cleaning c. Managing multiple data sources	DDD based on online data
3	Descriptive Analytics a. Business intelligence b. Data visualization	
4	Predictive Analytics a. Introduction b. Fitting a model to data (revisiting linear and logistic regressions) c. Classification d. Trees and random forest e. Clustering	Predictive analytics 1 – Linear Regression
5	Business Value of Predictive Analytics Results a. Goals, measures, and model evaluation b. Over-fitting and its avoidance	Predictive analytics 2 - Classification
6	Data Science Applications a. Recommendation systems b. Network analysis	
7	Ethics, Privacy and Security Challenges	Final project

* Note: the coverage of these topics may change slightly.

The course Moodle site will be the primary tool used to communicate messages and material to students. Therefore, it is advisable to visit the course's site before each lesson and at the end of the course.

Course slides will be available on the course site.

Assessment and Grade Distribution

#	Assignment type	Weight	Group size
1	DDD - group assignment and presentation in class	10%	3-4 students
2	Predictive Analytics 1 – Linear Regression	10%	3-4 students
3	Predictive Analytics 2 - Classification	10%	3-4 students
4	Final project – group assignment	50%	3-4 students
5	Final individual assignment	20%	1 student

Course Assignments

Assignment notes: You will complete assignments in self-selected groups of 3-4 individuals. You will submit each assignment by the beginning of the class on each assignment's due date. The general instructions for the assignments appear at the end of this document. Detailed instructions will be posted on the course's site (Moodle).
Should a student become unable to complete an assignment or course requirement, s/he must notify the TA of the course in advance via email.

Implications for Business Ethics

Issues in business ethics will be discussed on the 7th meeting. Specifically, we will discuss ethical issues of collecting and using online data, mobile data, and location data for business purposes. We will discuss privacy concerns of different data types and how data analytics may influence consumers and companies.

Grading Policy

The Faculty has implemented a grading policy for all graduate level courses. This policy applies to all graduate courses in the faculty and will be reflected in the final course grade. Accordingly, the final average of the class for this course (which is a core course) will fall between 78-82. Additional information regarding this policy can be found on the faculty's website.

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Evaluation of the Course by Students

Following completion of the course, students will participate in a teaching survey in order to evaluate the instructor and the course for the benefit of the students and the university.

Required Reading

- The primary course material is the course book *Data Science for Business* (Provost, F., Fawcett, T., O'Reilly Publisher, 2013).

Recommended Reading

- *Data Mining: Practical Machine Learning Tools and Techniques (Second Edition)* (Ian H. Witten., Eibe Frank., Morgan Kaufmann Publishers)

Course Assignments

Assignment 1 – Data Driven-Decision Making

You were asked to recommend an Israeli startup that your company should invest in.

The main questions are:

- Market potential (size, current technologies, etc.)
- Public/government interest in the topic
- Level of competition

Use online data to analyze the different options and provide a data-driven recommendation

Each group will present their analysis and recommendation in class (~a 4-minute presentation). Submission will include the presentation slide deck.

Assignment 2 - Making Your First Predictions Using Linear Regression

1. Perform data preprocessing – describe the steps you performed and the summary of the changes to the dataset (i.e. number of rows, columns, missing values, etc.).

2. Perform descriptive analytics – describe the key measures of important variables of the data, including single variable and multi-variables metrics.

3. Build a regression model to predict the dependent variable based on all the variables.

4. Evaluate the prediction model.

5. Estimate 3 different linear regression prediction models and compare their outputs.

For all questions, the answers should include the analysis performed (including code or screenshots from the platform), a summary of the results, and visualizations.

Assignment 3 - Classification Models

The dataset for the assignment will be posted on the course site on Moodle.

1. Perform data preprocessing and descriptive analytics (similar to the tasks performed in assignment 2).

2. Build classification models to predict the "Class" variable:
    a. Perform variables selection.
    b. Generate a Decision tree.
        i. Describe the generated tree. Can you explain the logic?
        ii. Calculate the information gain of the first two branches of the tree.
    c. Classify using logistic regression.

3. Estimate and compare the results of the different models – which model would you recommend?

For all questions, the answers should include the analysis performed (including code or screenshots from the platform), a summary of the results, and visualizations.