BRANDEIS UNIVERSITY

School of Business and Economics

BUS 51A – Introduction to Business Analytics with Excel

Summer 2026 | 10-Week Asynchronous

Instructor:	Yeabin Moon, Ph.D.
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Office Hours:	Please make an appointment online using the provided link or email me.

Class Information

Format: This is a fully asynchronous, 10-week online course. All course materials are available on the Moodle page. You may progress through the readings and lectures at your own pace. However, please note that homework assignments and the final project have fixed deadlines.

Lectures: Each week includes written readings, short framing videos, and Excel walkthrough videos (recorded via Echo360) where applicable. Videos are provided for Excel feature introductions; readings cover conceptual and applied content in greater depth.

Technology: This course requires Microsoft Excel (**desktop** version). Brandeis provides free access through your university credentials. The cloud version of Excel and Google Sheets **do not** support all features required for this course.

Course Materials

The primary materials for this course are **instructor-written readings** provided on Moodle each week. These readings are designed to be more detailed and applied than a standard textbook.

As supplementary references, the first part of the course draws on *Modern Data Analytics in Excel* and the second part on *Advancing into Analytics*, both by George Mount. These are available through Brandeis credentials on O'Reilly and are **optional** but useful for additional context.

Course Description

This course offers an introduction to data analytics using Microsoft Excel as the primary platform. The focus is on building practical, hands-on skills that are directly applicable to entry-level business roles. While Excel is the tool, the analytical concepts and workflows you learn transfer broadly across other platforms.

The course is structured around three areas: data preparation and transformation using Power Query; data summarization, visualization, and statistical inference using Excel; and an introduction to regression analysis for predictive analytics. These skills are integrated throughout the course and applied to a real-world dataset in the final project.

Credit Hours / Workload

This is a four-credit course. Success requires a minimum of **5 hours per week** on coursework, including readings, videos, practice exercises, and assignments. Please plan your schedule accordingly from the first week, as the workload is consistent throughout the 10-week term.

Learning Goals

By the end of this course, students will be able to:

1. Import, clean, and transform data using Power Query.
2. Develop Excel skills at a level expected for entry-level business positions.
3. Summarize and analyze datasets using Excel tools including pivot tables and statistical functions.
4. Create clear, meaningful data visualizations in Excel.
5. Apply basic statistical inference to draw conclusions from data.
6. Perform regression analysis and interpret results for predictive purposes.
7. Apply course skills to a real-world dataset and communicate findings effectively.

Prerequisites and Target Audience

Prerequisites: BUS 6a. Students who have taken BUS 51b may not enroll.

Audience: This is a required course for all business majors at Brandeis University. Even if this course can be exempted by taking similar courses in other departments, we strongly recommend that students with an interest in business take this course, as it teaches the Excel and data skills required in the workplace.

Course Website

All materials, readings, videos, and assignments are available on the Brandeis Moodle page. Please check Moodle regularly for updates and announcements.

Assessments

10 Homework Assignments	60% (6% each)
Final Project	40%

Homework Assignments (60%)

There are 10 weekly homework assignments, each worth 6% of your final grade. Assignments are designed to reinforce the week's content and, in several weeks, to directly build toward your final project. Late submissions will incur a penalty of 10% of the maximum possible credit. Assignments may be submitted up to one day late. No extensions will be granted.

Homework 1: Excel foundations — data types, key functions, basic formulas.

Homework 2: Applied Excel functions — VLOOKUP/XLOOKUP, IF/IFS, text and date functions.

Homework 3: Power Query I — importing and cleaning a messy dataset.

Homework 4: Power Query II + Project Milestone 1 — clean your Advan dataset and submit your POI selection and research question.

Homework 5: Descriptive statistics — pivot tables, summary statistics, written interpretation.

Homework 6: Data visualization — build and annotate charts from a provided dataset.

Homework 7: Probability and statistical inference — interpretation-focused written exercise.

Homework 8: Hypothesis Testing + Project Milestone 2 — before/after comparison using your Advan data.

Homework 9: Linear Regression + Project Milestone 3 — run and interpret regression on your Advan data.

Homework 10: Forecasting — build moving-average, exponential smoothing, FORECAST.LINEAR, and FORECAST.ETS forecasts, evaluate accuracy on a holdout window, and produce a 12-month forecast with a 95 % prediction interval.

Specific due dates will be posted on Moodle at the start of the semester.

Final Project (40%)

Theme: Policy Shock and Mobility Behavior

This is an individual project. You will use the **Advan mobility dataset** to investigate whether a recent policy shock affected foot traffic patterns around major technology employers and universities in the Boston–Cambridge area. You will work with data from two time periods — before and after the policy change — and conduct a structured analysis using the Excel skills built throughout the course.

Your project must include three components:

1. **Analytical Conclusion:** Using data evidence, answer your research question. Define your comparison strategy clearly, use appropriate visualizations, explain what each row of data represents, and provide a written managerial interpretation. Your goal is not to prove causality, but to present a reasonable, evidence-based argument.
2. **Forward-Looking Prediction:** Based on your analysis, make a data-driven prediction about how patterns may evolve. Include your reasoning, key assumptions, and whether you expect the effect to strengthen, weaken, or stabilize. The focus is on analytical thinking, not correctness.
3. **Limitations of the Analysis:** Discuss honestly what your analysis cannot prove — for example, data limitations, seasonality concerns, or correlation vs. causation. Strong projects clearly explain what they do not know.

Submission Requirements:

- Excel file with your full data analysis (Power Query steps, pivot tables, charts, regression output)
- Slide deck presenting your findings
- Recorded video presentation (approximately 10–15 minutes) walking through your slides and analysis

Grading Breakdown:

- Excel analysis: 15%
- Slide deck: 10%
- Video presentation: 15%

Important: Do not approach this project with political motivation. This is a data analysis exercise, not a political argument. Your analysis may conclude that there is evidence of impact, weak or mixed evidence, or no clear evidence — all three are acceptable outcomes if supported by careful reasoning.

Rules for Correspondence

When you send an email to me, please remember the following:

- Use only your Brandeis email account.
- Include "Bus 51a:" at the start of the subject line.
- If your email includes attachments, please list the names of attached files in the body.
- Be polite, respectful, and professional. Use an appropriate greeting and sign your full name.

Course Overview

This is a high-level overview of the course. Detailed weekly materials are available on Moodle. The schedule is subject to minor adjustments; updates will be posted on Moodle.

Week	Topic	Key Skills	Deliverable
1	Excel Foundations	Data types, IF/IFS, SUM/AVERAGE/COUNT, cell references	HW 1: Excel functions
2	Lookup & Text Functions	XLOOKUP, VLOOKUP, IFS, text & date functions	HW 2: Applied functions
3	Power Query I	Import, clean, filter, sort, data types, Applied Steps	HW 3: Power Query basics
4	Power Query II + Milestone 1	Merge, append, unpivot, M language, Advan dataset	HW 4 + Milestone 1: POI selection & research question
5	Descriptive Statistics & PivotTables	Mean, median, SD, QUARTILE, AVERAGEIFS, PivotTables	HW 5: Stats & PivotTable analysis
6	Data Visualization	Chart selection, design principles, trendlines, annotation	HW 6: Chart portfolio
7	Probability & Confidence Intervals	COUNTIF/COUNTIFS, empirical probability, T.INV.2T, CI	HW 7: CI interpretation
8	Hypothesis Testing + Milestone 2	T.TEST, paired & two-sample t-tests, p-value, effect size	HW 8 + Milestone 2: Before/after t-test
9	Linear Regression + Milestone 3	SLOPE, INTERCEPT, RSQ, LINEST, ToolPak regression	HW 9 + Milestone 3: Regression analysis
10	Forecasting & Final Project	Moving averages, exponential smoothing, FORECAST.ETS	HW 10: Forecasting + Final Project submission

Week	Topic	Description
Week 1	**Course Introduction & Excel Foundations**	What is data analytics, the analytics workflow, Excel essentials, understanding data types and structure. Introduction to the Advan dataset.
Week 2	**Working with Data in Excel**	Key Excel functions for data work: XLOOKUP, IF/IFS, text functions, date functions. Hands-on practice with real datasets.
Week 3	**Power Query I**	Importing and connecting to data sources, basic cleaning and transformation, filtering, sorting, and data type handling.

Week 4	**Power Query II**	Merging and appending tables, reshaping data, applying Power Query to the Advan dataset. Project Milestone 1 due.
Week 5	**Descriptive Statistics**	Measures of central tendency and spread, summarizing data with pivot tables, Excel statistical functions.
Week 6	**Data Visualization**	Chart types and when to use them, design principles, building clean and meaningful charts in Excel.
Week 7	**Probability & Statistical Inference**	Basic probability, sampling, confidence intervals, interpreting uncertainty in data.
Week 8	**Hypothesis Testing**	Comparing groups, t-tests in Excel, applying hypothesis testing to before/after comparisons. Project Milestone 2 due.
Week 9	**Linear Regression**	Simple and multiple regression in Excel, interpretation, prediction. Project Milestone 3 due.
Week 10	**Forecasting & Final Project**	Forecasting methods, finalizing analysis, recorded presentations. Final Project due.

University Policies

Academic Integrity

You are expected to be honest in all of your academic work. Please consult *Brandeis Rights and Responsibilities* for all policies and procedures related to academic integrity. Students may be required to submit work to TurnItIn.com software to verify originality. Allegations of alleged academic dishonesty will be forwarded to the director of academic integrity. Sanctions for academic dishonesty can include failing grades and/or suspension from the university. Citation and research assistance can be found on the university library website.

Special Accommodation

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please talk with me and present your letter of accommodation as soon as you can. I want to support you. In order to provide test accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support at 781-736-3470 or access@brandeis.edu.

Library

The Brandeis Library collections and staff offer resources and services to support Brandeis students, faculty and staff. These include workshops, consultations, collaboration, materials and instruction on emerging trends in technologies such as machine learning, emerging trends in research such as data visualization, and emerging trends in scholarship such as open access. Librarians at the Circulation Desk, Research Help Desk, Archives & Special Collections, Sound & Image Media Studios, MakerLab, AutomationLab, and Digital Scholarship Lab are available to help you.
https://www.brandeis.edu/library/about/index.html.

Student Support

Brandeis University is committed to supporting all our students so they can thrive. The following resources are available to help with the many academic and non-academic factors that contribute to student success (finances, health, food supply, housing, mental health counseling, academic advising, physical and social activities, etc.). Please explore the many links on this Support at Brandeis page (https://www.brandeis.edu/support/undergraduate-students/browse.html) to find out more about the resources that Brandeis provides to help you and your classmates to achieve success.

Counseling Services

Assessments, Short Term Stabilization, Group Therapy, Case Management, Urgent Care, Medication Evaluation and Management, Community Counselor, Consultation phone calls.
www.brandeis.edu/counseling

- Amy Scobie-Carroll, LICSW (Director)
- Peining Lo-Bromberg, MSW, LICSW, Community Therapist