Lahore University of Management Sciences

ECON 2301 – Data Analytics Lab 1

Summer 2024

Instructor	Yushma Umar
Room No.	ECON Wing A
Office Hours	By Appointment
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Telephone	
Secretary/TA	TBA
TA Office Hours	TBA
Course URL (if any)	
Support Services	LUMS offers a range of academic and other services to support students. These are mentioned below, and you are encouraged to use these in addition to in-class assistance from course staff. For a complete list of campus support services available for you click here (https://advising.lums.edu.pk/#supportservices)

Course Basics				
Credit Hours	2			
Lecture(s)	Nbr of Lec(s) Per Week	N/A	Duration	
Lab (per week)	Nbr of Lec(s) Per Week	4	Duration	175 Minutes
Tutorial (per week)	Nbr of Lec(s) Per Week		Duration	

Course Distribution	
Core	Yes
Elective	
Open for Student Category	Freshmen, Sophomores, Juniors
Close for Student Category	Seniors

COURSE DESCRIPTION

The purpose of this course is to help students learn basic data cleaning, visualization and analytical skills. This course will provide students with a hands-on experience in using Microsoft Excel and a well-known statistical software, STATA, to work on real time datasets. This course is primarily targeted towards rising ECON sophomores who intend to enroll in ECON 230 in the upcoming academic year. It will prepare them for ECON 330 and the Data Analytics Lab 2 courses. No prior knowledge of STATA or Excel is required for this course.

COURSE PREREQUISITE(S)

- None
- Anti-req: DISC 112
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COURSE OBJECTIVES

- Help students acquire basic to intermediate level proficiency in STATA and Microsoft Excel
- Provide the students with the opportunity to apply the theoretical concepts they will learn in ECON 230
- Prepare students for ECON 330 and Data Analytics Lab 2 courses

Lahore University of Management Sciences

Learning Outcomes	
•	Learning common Excel functions and basic STATA commands
•	Creating dynamic reports through Pivot Tables in Excel
•	Learning to do basic data cleaning in Excel and STATA
•	Generating basic graphs and charts in Excel and STATA

Grading Breakup and Policy

Assignment(s): 20% - 2 Take-Home Assignments
Quiz(s): 20% - 2 Lab Quizzes (no n-1)
Midterm Examination: 30%
Final Examination: 30%

The quiz dates and deadlines for the assignments will be communicated in advance during the lab sessions.
In case of a missed quiz, midterm or final, you will have to file a petition with the OSA within 3 days of missing the instrument. If the petition is approved by the OSA, the student will be assigned his/her own average score based on the other attempted graded instruments.

NO LATE/ONLINE SUBMISSIONS WOULD BE ENTERTAINED.

Examination Detail	
Midterm Exam	Yes/No: Yes Combine Separate: N/A Duration: TBA Preferred Date: TBA Exam Specifications: Open Book, Open Notes
Final Exam	Yes/No: Yes Combine Separate: N/A Duration: TBA Exam Specifications: Open Book, Open Notes

Campus supports & Key university policies

Campus Supports

Students are strongly encouraged to meet course instructors and TA's during office hours for assistance in course-content, understand the course's expectations from enrolled students, etc. Beyond the course, students are also encouraged to use a variety of other resources. (Instructors are also encouraged to refer students to these resources when needed.) These resources include Counseling and Psychological Services/CAPS (for mental health), LUMS Medical Center/LMC (for physical health), Office of Accessibility & Inclusion/ OAI (for long-term disabilities), advising staff dedicated to supporting and guiding students in each school, online resources (https://advising.lums.edu.pk/advising-resources), etc. To view all support services, their specific role as well as contact information click here (https://advising.lums.edu.pk/#supportservices).

Academic Honesty/Plagiarism

LUMS has zero tolerance for academic dishonesty. Students are responsible for upholding academic integrity. If unsure, refer to the student handbook and consult with instructors/teaching assistants. To check for plagiarism before essay submission, use similarity@lums.edu.pk. Consult the following resources: 1) Academic and Intellectual Integrity (http://surl.li/gpvwb), and 2) Understanding and Avoiding Plagiarism (http://surl.li/gpvwo).

Lahore University of Management Sciences

LUMS Academic Accommodations/ Petitions policy

Long-term medical conditions are accommodated through the Office of Accessibility & Inclusion (OAI). Short-term emergencies that impact studies are either handled by the course instructor or Student Support Services (SSS). For more information, please see Missed Instrument or 'Petition' FAQs for students and faculty (https://rb.gy/8sj1h)

LUMS Sexual Harassment Policy

LUMS and this class are a harassment-free zone. No behavior that makes someone uncomfortable or negatively impacts the class or individual's potential will be tolerated.

To report sexual harassment experienced or observed in class, please contact me. For further support or to file a complaint, contact OAI at oai@lums.edu.pk or harassment@lums.edu.pk. You may choose to file an informal or formal complaint to put an end to the offending behavior. You can also call their Anti-Harassment helpline at 042-35608877 for advice or concerns. *For more information: Harassment, Bullying & Other Interpersonal Misconduct: Presentation (http://surl.li/qpvwt)*

COURSE OVERVIEW

Lecture	Topics	Recommended Readings
1,2	Introduction to Microsoft Excel: Cells, Ranges, Worksheets & Workbooks Advantages and Disadvantages of Excel Formatting and Entering Data Basic Data Manipulation Basic Arithmetic Cell Operations Basic Formulas and Functions e.g. SUM, AVERAGE, MAX, MIN, COUNT etc	Curtis Frye Ch. 1, 2, 3 & 4 Class Notes
3,4	Filtering and Sorting Data Data Validation Data Manipulation and Organization Conditional Formatting Text Functions e.g. LEN, UPPER, LOWER, CONCATENATE Dealing with Data Quality Issues e.g. missing values, duplicates, formatting issues etc	Curtis Frye Ch. 5 & 6 Class Notes / Handouts
5,6	Logical Functions Data Retrieval Functions e.g. VLOOKUP Date & Time Functions Importing Datasets from Multiple Sources	Curtis Frye Ch. 6 & 7 Class Notes / Handouts
7,8	Data Visualization Pivot Tables	Curtis Frye Ch. 9 & 10 Class Notes / Handouts
9, 10	Analysis ToolPak What-if Analysis	Curtis Frye Ch. 8 Class Notes / Handouts
11 / 12	**Midterm Exam (Before Eid Holidays)**	
13, 14	Introduction to STATA Difference between STATA & Excel Basic STATA Interface Opening dta files or system datasets Making & formatting do files Starting a log file Importing Datasets Browse, Describe, Sum, Tabulate etc	Pfaff (2009) Ch. 1, 2, 4 & 6 Class Notes
15, 16	Reading Datasets Describe & analyze data using tabstat, codebook, one way and two-way tabulation Generating Detailed Summary Statistics	Pfaff (2009) Ch. 3 & 5 Baum (2009) Ch. 2 & 3 Class Notes

	If conditions, and/or operators Identifying Variable Types e.g. String, Numeric, Categorical Display & Assert Commands	
17	Checking for Missing Values Dropping Variables & Observations Changing Variable Types	Pfaff (2009) Ch. 5 Class Notes
18	Generating Variables Recoding Missing Values Assigning Variable Labels Defining & Assigning Value Labels	Pfaff (2009) Ch. 5 Class Notes
19, 20	Key Principles of Data Visualization One-way Graphs e.g. Bar Graph, Histogram etc Two-way Graphs e.g. Scatterplot, Line Plot etc	Pfaff (2009) Ch. 6 Mitchell Ch. 1, 2, 3, 5, 6, 8, 9, 10 & 11 Class Notes / Handouts
21, 22	Running ttests Generating Correlation Matrices Identifying Levels of Datasets Checking for Unique Identifiers in Datasets 1:1 Merging Simple Regression (Tentative) Loops (Tentative)	Pfaff (2009) Ch. 5 Class Notes / Handouts
TBA	**Final Exam**	

Textbook(s)/Supplementary Readings

Required Texts:

Frye, Curtis D. *Microsoft Excel 2013 Step by Step*. 28 Oct. 2013.
Pfaff, Tobias. "A Brief INTRODUCTION TO STATA WITH 50+ BASIC COMMANDS." Institute for Economic Education, University of Münster (2009).
Baum, Christopher F. An introduction to Stata programming. Vol. 2. College Station: Stata Press, 2009.
Mitchell, Michael N. *A Visual Guide to Stata Graphics*. College Station, Texas, Stata Press, 2012.

Additional Texts:

Powell, Stephen G, and Kenneth R Baker. *Management Science : The Art of Modeling with Spreadsheets*. Hoboken, New Jeresey, Wiley, 2014.
Hamilton, Lawrence. *Statistics with Stata : Updated for Version 12.* Pacific Grove, Brooks/Cole, 2013.
Phil, and Frauke Kreuter. *Data Analysis Using Stata*. College Station, Tex., Stata Press, 2012.
Engebretsen, Martin, and Helen Kennedy. *Data Visualization in Society*. Amsterdam, Amsterdam University Press, 2020.