Spring 2021
Basic Statistics APSTA-UE 1085
Steinhardt School, New York University

Instructor (Lecture): **Rossi A. Hassad, PhD, MPH** Email: rh372@nyu.edu **Lecture:** Mon & Wed: 3.30 PM - 4.45 PM **Location**: **ONLINE** Instruction is online at a set day or time meeting pattern and must be attended at that scheduled time, regardless of the student's location/time zone. **Office Hours**: By Appointment	**Lab Instructor:** **João M. Souto Maior** Email: jms1738@nyu.edu **Lab:** Thu: 11AM - 12.15 PM Thu: 3:30PM – 4:45 PM **Location**: **ONLINE** Instruction is online at a set day or time meeting pattern and must be attended at that scheduled time, regardless of the student's location/time zone.
NOTE: All synchronous (LIVE) sessions will be conducted via ZOOM.	

Course Description: This introductory course is designed to prepare undergraduate & master's level students to use statistics for data analysis. This course covers descriptive and inferential statistics; including frequency distributions, graphs, measures of central tendency, measures of variability, sampling, probability, z-score, the normal distribution, and tests of hypothesis such as t-tests, ANOVA, linear correlation and regression, and chi-squared analysis. Effect size, study designs (observational and experimental) and research concepts (association and causation; confounding and interaction) will also be addressed. The IBM-SPSS software will be used for data analysis. **Liberal Arts Core/CORE Equivalent - satisfies the requirement for Quantitative Reasoning**

Note: All assignments (including deadlines), course notes, and other materials will be posted on the NYU Classes course website. Also, a basic calculator is required for this course.

Prerequisites: This is a basic statistics course, and is designed to serve as a first course in statistics. A sound understanding of basic arithmetic and algebra, and possession of general computer skills are required.

My Teaching Philosophy & Approach:
Let me begin by saying that I recognize the high level of anxiety that is generally associated with the introductory statistics course, as it is often equated to mathematics, and perceived to be difficult. However, be assured that this course will not focus on mathematics; rather, the emphasis will be on statistical literacy, conceptual understanding and applications. My primary goal is to facilitate you to make sense of data, using basic statistical methods and computer applications, and to appreciate and engage in evidence-based decision-making. Most of all, I want you to have fun learning, by exploring data and discovering the underlying meaning and "story". Multiple assessment methods and active learning strategies will be used to meet your diverse learning styles.

The following publication may give you some insight into my teaching philosophy and approach: http://scholarcommons.usf.edu/numeracy/vol4/iss2/art7/ - click on "download" for the full paper (*Constructivist and Behaviorist Approaches: Development and Initial Evaluation of a Teaching Practice Scale for Introductory Statistics at the College Level*)

Required Text: Intro Stats (5th Edition) by De Veaux, Velleman, and Bock:

ISBN-13: 978-0134210223

Recommended Text: Statistics Using SPSS: An Integrative Approach by Weinberg and Abramowitz: ISBN-13: 978-0521676373

Learning Objectives:

- To identify and apply appropriate statistical methods based on research design, hypothesis/objective, type of data, number of variables, assumptions, etc.

- To differentiate between "association" and "causation" in the analysis of research outcomes

- To recognize the utility and limitations of statistical techniques

- To read and understand the statistics presented in the scientific literature

- To compute and communicate statistical information

- To interpret statistical notations and outcomes, and write a scientific report

Assessment:

In general, all students will be required to participate in group problem-solving, discussions, computer laboratory exercises, demonstrations based on class-generated and secondary data, critique of statistics in peer-reviewed articles and the popular press, as well as written and oral presentations. Multiple assessment methods and active learning strategies will be used to meet your diverse learning styles. It is your responsibility to obtain the required material and complete all assignments in a timely manner. NYU's attendance policy will be enforced.

Homework: The course will be taught in a modular format (moving from descriptive to inferential statistics) with each module addressing a particular statistical test or set of related concepts. Accordingly, there will be eight (8) graded homework assignments, each with two components; manual calculations, and SPSS analysis and report.

The IBM-SPSS software will be used for data analysis, and laboratory assistance will be provided. All lab assignments can be completed via the NYU Virtual Computer Lab.

Exams: There will be one midterm and one cumulative final exam.

Exploratory Data Analysis (EDA) Project: In order to demonstrate the integration and application of knowledge and skills in a meaningful way, you will be required to complete a project during the semester in which you will explore and analyze secondary data using the IBM-SPSS software, interpret your results, and provide a coherent written report following the APA guidelines. Other requirements and expectations will be discussed in class, and a template will be provided.

Assessment Weighting

Homework (combined manual calculations, SPSS analysis, and report):   30%
Midterm Exam: 20%
Final Exam: 40%
Project (EDA – Exploratory Data Analysis)   10%

Grade Calculation	
A	93 -100
A-	90 - 92
B+	87 - 89
B	84 - 86
B-	80 - 83
C+	77 - 79
C	74 - 76
C-	70 - 73
D+	67 - 69
D	65 - 66
F	below 65

All components of the assessment must be completed satisfactorily in order to obtain a passing grade.

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DATE	LECTURE TOPIC and LAB	READING ASSIGNMENT
	Overview of Statistics (including historical perspective and statistical literacy) Types of Data and Levels of Measurement	Chapter 1
	Organizing & Exploring Data: Frequency Distributions, Cross-tabulation, Measures of Central Tendency, Graphs	Chapter 2 Chapter 3
Lab # 1	Introduction to SPSS: Defining variables, types of data, split file, measures of central tendency, cross-tabulation, graphical representations of data	
	Measures of Variability	Chapter 3
	z-score & the Standard Normal Distribution	Chapters 4 & 5
Lab # 2	Combined measures of central tendency, measures of dispersion, skewness, graphs, report writing	
	Probability & Sampling Standard Error & Distribution of Sample Means	Chapters 9 & 10 Chapter 15
Lab # 3	The empirical rules of the normal curve Distribution of z-scores (mean, SD, and shape)	
	Hypothesis Testing & Estimation: Significance, Confidence Interval, and Effect Size	Chapters 16 , 17 & 19
Lab # 4	Estimation: Sample size, standard error of the mean, confidence intervals (95% and 99%), precision of estimates	
	Introduction to the t-statistic (one sample)	Chapter 18
	Association & Causation (Experimental and Observational Research Designs), Considerations for Data Collection and Data Analysis - reliability, validity, confounding, interaction **Mid-Term Exam Review**	Chapter 11
Lab # 5	One-sample t-test: Data entry, analysis, interpretation, report writing (see format and guidelines), editing of output tables	
TBA	**MID-TERM EXAMINATION**	**Covers all material up to and including the one-sample t-test**
	The Independent Samples t-test	Chapter 20
Lab # 6	The Independent samples t-test: Data entry, analysis, interpretation (including the Levene's test for equality of variances), report writing (see format and guidelines), editing of output tables	
Lab # 7	The Dependent (paired) Samples t-test: Data entry, analysis, interpretation, report writing (see format and guidelines), editing of output tables	
	One-way ANOVA	Chapter 24

Lab # 8	One-way ANOVA: Data entry, analysis, interpretation (including the Levene's test for equality of variances), post-hoc analysis, report writing (see format and guidelines), editing of output tables, graph of group means	
	ANOVA (two-way/factorial design)	
Lab # 9	Two-way ANOVA: Data entry, analysis, interpretation (including cell and marginal means, and graphs for interaction effect), the Levene's test for equality of variances, post-hoc analysis, report writing, editing of output tables	
	Simple Linear Correlation Analysis	Chapters 6, 7, 8 & 23
Lab # 10	Pearson's correlation: Data entry, analysis, interpretation, scatter plots, confounding	
	Simple Linear Regression Analysis	
Lab # 11	Combined simple linear correlation and regression: Data entry, analysis, interpretation, editing of output tables, report writing (see format and guidelines)	
	Chi-Squared and other non-parametric tests	Chapters 22 & 25
	Introduction to Multiple Regression Analysis	
Lab # 12 Final Lab	Chi-squared analysis (including Yate's continuity correction for 2 x 2 contingency tables): Data entry, analysis, interpretation Final Exam Review (refer to the review sheet)	
	Final Exam Review Session	
TBA	**FINAL EXAMINATION**	**Cumulative**

Academic Integrity: Academic integrity is the guiding principle for all that you do; from taking exams, making oral presentations to writing term papers. It requires that you recognize and acknowledge information derived from others, and take credit only for ideas and work that are yours. Please refer (see link below) to the full text of the applicable statement on academic integrity. http://steinhardt.nyu.edu/policies/academic_integrity

Accommodations:

NYU is committed to facilitating equal access for students with disabilities, including hearing and visual impairments, mobility impairments, learning disabilities and attention deficit disorders, chronic illness, and psychological impairments. Per NYU policy, students seeking accommodation are required to contact the Moses Center on 240 Greene Street, 2nd Floor, 212-998-4980.