"It is not knowledge, but the act of learning, not possession but the act of getting there, which grants the greatest enjoyment." Karl F. Gauss

University of Memphis

DEPARTMENT OF MATHEMATICAL SCIENCES
THE UNIVERSITY OF MEMPHIS

Prob/Statistics/Non Calculus - 20688 - MATH 1530 - 003

Instructor: Alpha BA
Office: Dun Hall Room 374
Virtual office hours : Wednesday 10:00am – 11:00am or by Appointment
Phone: (901) 678-1757
Email: alphaba@memphis.edu
Classroom: MWF 910-1005 Remotely

DESCRIPTION: Introduction to statistical literacy focusing on understanding such concepts as: sample surveys, observational studies, and experiments; methods ofsampling; measures of central tendency and variation; graphical representations of data; basic concepts of probability; the normal distribution; basic principles of hypothesis testing; p-values; and correlation vs causation. NOTE: Math majors may not use this course as part of the major.
PREREQUISITE: MATH 1710 with a minimum grade of C-, or an ACT MATH subscore of at least 15. [G]

Student population: Lower Division Students. This course will fulfill a mathematics general education requirement in some degree programs.

Textbook: *We will be using an online textbook available on TopHat.This semester section MATH 1530 is being offered as a Remote Course, lectures will be given via Zoom.*

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Topics Covered:

Part I: This section of the course will lay the foundation for why the study of statistics is important to everyone and provide some basic tools that consumers of statistics can use to judge the validity and quality of statistical information they receive. Emphasis will be on developing the concepts of random sample, designed experiments, observational studies, good survey practices, and looking for misleading components of an analysis. Topics include:

Observational
studies Experiments
Data ethics
Measurement mistakes
Sampling methods
Confounding variables
Percentages in
statistics Level of
measure
Data types – discrete and continuous

Part II: In this section of the course you will learn to draw and interpret various graphs and learn which type of graph is appropriate for the type of data you have. You will also learn about measures of central tendency and variation and learn which measure is most appropriate for the level of measure of your data (nominal, ordinal, or numerical. This section is important in order for you to be able to perform exploratory data analysis on data you collect in order to understand what level of measure you have and what sort of further analysis might be most appropriate. Topics include:

Histograms
Frequency distributions
Graphs – bar graphs, pie charts, line graphs,
stemplots Numerical descriptions of data
Measures of central tendency – mean, median, mode
Measures of variation – five number summary, standard deviation

Part III: This section of the course will focus on the various ways of defining probability and the rules that all probability assignments must follow. We will learn to compute probabilities for common models such as tossing a coin and rolling a die. The concepts of sample space, events, mutually exclusive events, independent events and conditional probability will be discussed. Also discussed will be the assignment of personal probabilities and why these are often distorted and how and why our intuition can vastly differ from true probabilities.

Properties of the normal distribution will be discussed as well as standardizing values and obtaining probabilities associated with the normal distribution. In addition concepts of correlation and best-fit lines for prediction will be discussed, including correlation

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versus causation. It is essential that you gain an understanding of the material in this section in order to understand the results of any analysis you choose to perform on your data. For this section there will be supplemental material to that presented in the textbook. Topics include:

Normal distribution
Central limit
theorem Statistical
significance
Probability
Risk
Expected
values
Correlation

Part IV: Inference. In this section various types of analysis are discussed. The type of analysis that is appropriate depends on what you want to do with your data – whether estimate an unknown quantity or test a hypothesis. The type of analysis also depends on what level of measure you have in your data. We will discuss concepts such as the p-value which will rely heavily on the previous section's material, as well as how to set up a hypothesis test – which should be null and which should be alternative, and we will compute some confidence intervals and learn the correct interpretation of our results. This section is important in that it will demonstrate some basic concepts and techniques that will allow you to start thinking about appropriate analysis. Topics include:

Variation in samples
Estimating means
Estimating
proportions
Confidence intervals
Hypothesis testing
Meta-analysis

REQUIRED EQUIPMENT: All Coursework will be done at TopHat.com and will come with an online access code that will allow the student to do the on-line all assignments. Internet access will be required for on-line homework assignments.

REQUIRED EXCEL LABS:

There will be 2 excel labs during the semester. Since we will be using Excel for Stat Labs, you need to download and install Microsoft Office on your own personal devices free of charge at http://memphis.edu/getoffice . Each lab will be turn in by April 27 ,2021.
Labs cannot be made up so it is very important that you not miss any labs.

EVALUATION:

There will be three (3) in class tests plus a final exam worth 100 points each. In addition, there will be daily in class exercises, assignments or activities that will count a total of 100 points. The excel labs will count a total of 100 points towards the final grade. There will be 100 points possible for attendance. Students will need to participate in 4 surveys which will be another 100 points. The total possible number of points is 800.

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The students grade in the course will be based on the percentage of the possible 800 points obtained according to the following scale.
90-100% - A
80 - 89% - B
70 – 79% - C
60 – 69% - D
Below 60% - F
No makeup tests will be given. If you miss more than one test you will receive a zero on each test missed after the first. If you miss the final exam you will receive a grade of zero on the final exam. Each in-class assignment is to be completed during the scheduled class time or by the deadlines. No replacement grades will be possible for any in class activity. It is very important that you do not miss any tests or homework assignments or excel labs.

Plagiarism and Integrity
Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class in addition to other possible disciplinary sanctions which may be imposed through the regular institutional disciplinary procedures. Expectations for academic integrity and student conduct are described in detail on the website of the Office of Student Accountability opens in new window opens in new window. Please read in particular, the section about "Academic Misconduct opens in new window opens in new window".

Library, Tutoring, and Other Resources

- The myMemphis Portal system, eCampus Student tab provides access to University library opens in new window opens in new window.
- Tutoring: Free tutoring is available through the University's Education Support Programs. They offer online assistance via https://memphis.upswing.io/
- Other support services are available through the Educational Support Program.

Students with Disabilities
Students with accessibility issues or learning accommodation issues due to a disability should contact Disability Resources for Students (DRS) to submit an official request for course accommodations. Contact DRS at 901.678.2880 or at drs@memphis.edu. (https://www.memphis.edu/drs/index.php)

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(https://www.memphis.edu/osa/students/academic-misconduct.php)

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Student Health
Students who have a positive COVID-19 test should contact the Dean of Students at deanofstudents@memphis.edu.

https://www.memphis.edu/msci/news/covid.php

Student Resources
Students who need additional resources can visit the Dean of Students Office website at https://www.memphis.edu/deanofstudents/crisis/index.php.

Sexual Misconduct and Domestic Violence Policy

This policy specifically addresses sexual misconduct which includes dating violence, domestic violence, sexual assault, and stalking. The policy establishes procedures for responding to Title IX-related allegations of sexual misconduct. Complaints can be reported to the Office for Institutional Equity (OIE). The OIE office is located in the Administration Building, Room 156. You may contact the OIE by phone at 901.678.2713

or by email at oie@memphis.edu opens in new window opens in new window. Complaints can be submitted online at File a Complaint opens in new window opens in new window.

Non-Discrimination and Anti-Harassment Policy

University policy prohibiting discrimination and harassment based on protected characteristics and classes. Complaints of discrimination and harassment can be reported to the Office for Institutional Equity (OIE). You may contact OIE by phone at 901.678.2713 or by email at oie@memphis.edu. The full text of the policy can be found at GE2030 - NONDISCRIMINATION AND ANTI-HARASSMENT opens in new window opens in new window.

Syllabus Changes

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

Academic Misconduct strictly enforced