"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 - 22711 - MATH 1530 - 006

Instructor: Alpha BA
Office: Dun Hall Room 374
Phone: (901) 678-1757
E-mail Address:alphaba@memphis.edu
Virtual Office Hours: Wed 10:00am-11:00am or by Appointment
Classroom: (Remotely) 11:20 am - 12:45 pm TR

DESCRIPTION: Introduction to statistical literacy focusing on understanding such concepts as: sample surveys, observational studies, and experiments; methods of sampling; 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: *Statistical Reasoning for Everyday Life,* by Bennett, Briggs and Triola, Pearson publishing.

Required equipment: The textbook is required and will come with an online access code that will allow the student to do the online homework assignments. Internet access will be required for online homework assignments. The login site for the online homework is http://www.pearsonmylabandmastering.com/northamerica/mystatlab/

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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 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

Assessment and Grading

The 13 Homework Sets, the 6 Tests and the Comprehensive Final exam will be taken MyMathLab. The online Testing will be timed (1 hour and 30 minutes), the final will be 2 hours. Again, There will be: 13 Homework Sets ,6 Tests and 1 Comprehensive Final Exam. The times and dates (Homework, Tests and Final exam) are given in advance so that the students are aware/Alert.

Grading Procedure

Your final grade will be determined by the Comprehensive Final exam, your best 10 homework sets score and the best 5 tests score for the semester. So the Comprehensive Final Exam is worth 20% , the 10 Homework Sets worth 30% and the 5 Tests worth 50%. No make-up exams.

Test(s) : 5 Tests @ 10% each = 50%

Homework sets : 10 @ 3 % each = 30%

Final Exam : 20%

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Grading Scale

90-100 – A ; 80-89 – B ;70-79 – C ; 60-69 – D ; below 60 -F

All scheduled tests must be taken. NO make-up tests are permitted. If you missed, then it will be an automatic F grade.

Homework Schedule:

Homework 0 From January 19 – April 27 at 11 pm CST (How to use MyMathLab)
Homework 1 from January 19 to February 2nd at 11 pm CST
Homework 2 from January 19 to February 2nd at 11 pm CST
Homework 3 from January 19 to February 2nd at 11 pm CST
Review Exam 1 02/01/2021
- Exam 1 02.02.2021 at 1120am and Due at 12:45pm CST

Homework 4 from February 3 to February 18 at 11 pm CST
Review Exam 2 02/17/2021
- Exam 2 02.18.2021 at 11:20am and Due at 12:45pm CST

Homework 5 from February 19 to March 4 at 11 pm CST
Review Exam 3 03/03/2020
- Exam 3 03.04.2021 at 1120am and Due at 12:45pm CST

Homework 6 March 5 to March 23 at 11pm CST
Homework 7 March 5 to March 23 at 11pm CST
Review Exam 4 03/22/2021
- Exam 4 Start 03.23.2021 at 11:20 am and Due at 12:45pm CST

Homework 8 March 24 to April 8 at 11pm CST
Homework 9 March 24 to April 8 at 11pm CST
Review Exam 5 04/07/2021
- Exam 5 Start 04.08.2021 at 11:20am and Due at 12:45pm CST

Homework 10 from April 9 to April 27 , 2021 at 11 pm CST
Homework 11 from April 9 to April 27 , 2021 at 11 pm CST
Homework 12 from April 9 to April 27 , 2021 at 11 pm CST
Review Exam 6 04/26/2021
- Exam 6 Start 04.27.202 at 11:20am and Due at 12:45pm CST

Review Comprehensive Final Exam 04/28/2021 to 05/05/2021
Comprehensive FINAL EXAM Thursday, May 6, 2021 from 8:00 am- 10:00am

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".

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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

Student Accommodations

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)

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.

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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 byphone 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