Math 1530: PROB/ STATISTICS/ Non Calculus (Section 007)-Fall 2015

Class: TR Room: DH 129 Time: 11.20 AM to 12.45 PM

Instructor: Manohar Aggarwal; **Office Room #:** 386 Dunn Hall
Email: maggarwl@memphis.edu; **Office Hours: Wednesday: 1 PM to 2 PM (or by appointment); Thursday: 2.30 PM to 3.30 PM (or by appointment)**

Textbook: Textbook: *Statistical Reasoning for Everyday Life* , 4th edition, 2014 by Bennett, Briggs and Triola, Pearson publishing. ISBN: 9781323148723

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, stemplot
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

REQUIRED EQUIPMENT:

The textbook is required and will come with an online access code that will allow the student to do the on-line homework assignments. Internet access will be required for on-line homework assignments.

REQUIRED EXCEL LABS:

There will be 5 excel labs during the semester. Since we will be using **Excel for Stat Labs, y**ou need to download and install Microsoft Office on your own personal devices free of charge at http://memphis.edu/getofficeEach lab will be during scheduled class time for this course. Each lab will have an assignment for the student to turn in. Labs cannot be made up so it is very important that you not miss any labs.

RESOURCES AVAILABLE TO THE STUDENT:

If you need help in the course, please do not hesitate to contact me during my office hours or at other time by appointment. Free tutoring help is also available through the Educational Support Program (ESP) in Dunn Hall room 143. Go to the Department of Mathematical Sciences' web page at www.msci.memphis.edu to find the hours of operation. The math department has made it a priority to have at least one graduate student studying statistics available at all times. This is a wonderful resource that is free to you. Take advantage of it or make arrangements to visit your instructor for more help.

EVALUATION:

There will be three in class tests plus a final exam worth 100 points each. In addition there will be on-line homework assignments 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. The total possible

number of points is 700. The students grade in the course will be based on the percentage of the possible 700 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 must miss a test for any reason, your final exam grade may be used to replace the test missed if approved by the instructor. 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 homework assignment will have a due date assigned. If the homework is not completed by the due date, the student will receive a grade of zero on that assignment. No replacement grades will be possible for any homework assignments not completed by the due date. **It is very important that you do not miss any tests or homework assignments or excel labs.**

ATTENDANCE:
Attendance in the course is mandatory and will be given a score which will be considered as a part of the grade. The attendance grade will be computed according to the following rules:

Four /4/ points off the attendance grade of /100/ will be deducted for each absence that is not excused for classes that meet two times per week (either MW or TR).

Excused absences will be approved by the course coordinator for Math 1530, Dr. Dale Bowman and you may contact her regarding absences at ddbowman@memphis.edu.
/ example: if student missed 2 classes without excuse from a TR class, his/her attendance score will be 100- 2x4 = 100-8=92 /.
YOU MUST STAY FOR THE ENTIRE CLASS PERIOD TO BE CONSIDERED PRESENT DURING THE CLASS.

STUDENT DISABILITY POLICIES ACOMODATION AND SERVICES: Information available at www.memphis.edu/sas

ACADEMIC MISCONDUCT: The University policy is available at
www.memphis.edu/studentconduct/miscondut.htm
The instructor has the right to remove anyone from the classroom for disruptive behavior at any time and has the right to have the student removed from the class. If you are removed from the class you will be considered absent for that class period. Behavior that might be considered disruptive includes but is not limited to:

Cell phones that ring in class
Talking during class
Interrupting the instructor during a lecture
Leaving before the class is over
Making rude sounds in class

The professor reserves the right to make any necessary changes to the information provided in the syllabus during the semester.

Fall 15 Schedule **Math1530Sec007**

TR

25-Aug Section 1.1 &1.2 What is/are statistics and Sampling

27-Aug Excel lab 1 Introduction to Excel

1-Sep Section 1.3&1.4 Types of statistical studies & Should we believe a stat study?

3-Sep Excel lab 2 Sampling

8-Sep Section 2.1 Data types and levels of measurement

10-Sep Section 2.2&2.3 Dealing with errors& Use of percentages in statistics

15-Sep TEST1 Chapters 1 & 2

17-Sep Section 3.1&3.2 Frequency Tables & Picturing distributions of data

22-Sep Section 3.3&3.4 Graphics in the media& A few cautions about graphics

24-Sep Section 4.1 & 4.2 What is average

29-Sep Excel Lab 3 Exploratory data analysis

1-Oct Section 4.3 & 4.4 Measures of variation & Statistical Paradoxes

6-Oct Sec 5.1 What is normal

8-Oct section 5.2&5.3 Properties of the normal distribution &Central limit theorem

13-Oct OFF

15-Oct Test 2 Chapters 3, 4 & 5

0ct 20 Section 6.1& 6.2 The role of probability in statistics & Basics of Probability

22-Oct Section 6.3 & 6.4 The law of large numbers & Ideas of risk and life expectancy

27-Oct Excel lab 4 probability through simulation

29-Oct Section 6.5 Combining probabilities

3-Nov Section 7.1 & 7.2 Seeking correlation & Interpreting correlation

5-Nov Section 7.3 & 7.4 Best-fit lines and prediction & The Search for casuality

10-Nov TEST 3 Chapters 6 & 7

12-Nov Excel Lab 5 Correlation

17-Nov Section 8.1 & 8.2 Sampling distributions & Estimating Population Means

19-Nov Section 8.3 Estimating population proportions

24-Nov Section 9.1 Fundamentals of hypothesis testing

26-Nov OFF

1-Dec Review Final Ex

10-Dec Final Exam 8.00 to 10.00