Math 1530: PROB/ STATISTICS/ Non Calculus M 50-Spring 2021 (Syllabus)

NOTE: Math 1530 M 50 is a web class that is taught completely online and instructional mode is WEB in Banner.

PREREQUISITE: MATH 1710 with a minimum grade of C- or an ACT MATH subscore of at least 15
Students who have enrolled without satisfying the pre-requisites are subject to dis-enrollment by the Mathematical Sciences Department.

Instructor: Manohar Aggarwal **Email address**: maggarwl@memphis.edu

Communication:
Email is the best way of communication as I check my emails frequently during the day. You may please use my regular UofM email address (maggarwl@memphis.edu). To better serve you **please include in the subject line of your email "MATH 1530 M 50 ".** You should also include your name in your message.

I can only respond to your emails sent through UofM email (@memphis.edu).

Virtual Office Hours: Mondays and Wednesdays: 10.00 AM to 11:00 AM or by appointment.

I will also be available via **Virtual Office Hours** through web conference.

Textbook: *Statistical Reasoning for Everyday Life* , 5th edition, 2018 by Bennett, Briggs and Triola, Pearson publishing. ISBN: 9780135910474 (please make sure when you buy the book it should come with **MyLab Statistics Access Code)**

Instructor's Course ID: aggarwal12330 **(no space between my last name aggarwal and number 12330)**

Book/Access Code: If you have any question about the purchase of the book or about MYSTATLAB then you can contact Nicholas Umerberger through email at Nicholas.umberger@pearson.com

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 **2 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/getoffice Each lab will be during scheduled class time for this course. Each lab will have an assignment for the student to turn in.

Assessment and Grading

Testing Procedures

Midterm Tests:

There will be **three** midterm tests. **Test 1** will be on **Tuesday, February 9, 2021, Test 2** will be on **Thursday, March 4, 2021,** and **Test 3** will be on Tuesday, April 6, 2021. Each **test will be of one and half hour duration** and will be worth 100 points each. You can take midterm test anytime during **9.30 AM to 9.30 PM on the same day. This is a timed exam and cannot be stopped once you have started. You should set aside a two-hour block of time when you can focus without interruption.**

No **makeup tests** will be given. **If you must miss a test for any reason, your final exam score will be used to replace the test missed. 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 get a grade of zero on your final exam.**

COMPREHENSIVE FINAL EXAM:

There will be a comprehensive final exam on **Tuesday, May 4, 2021,** which will be of two hours duration and will be worth 100 points. You can take **final exam** anytime during **9.30 AM Tuesday to 9.30 PM Tuesday.** This is a timed exam and cannot be stopped once you have started. You should set aside a block of two and a half hours time when you can focus without interruption.

GRADING PROCEDURE

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. The total possible number of points is 600. The students grade in the course will be based on the percentage of the possible 600 points obtained according to the following scale.

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

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 homework assignments or excel labs.**

Tests and Final Exam Schedule:

Final Exam and Test Dates:
Final Exam: Tuesday, May 4, 2021
Test 1: Tuesday, February 9, 2021
Test 2: Thursday, March 4, 2021
Test 3: Tuesday, April 6, 2021

RESOURCES AVAILABLE TO THE STUDENT:
If you need help in the course, please do not hesitate to contact me during my virtual office hours as given above or at other time by appointment.

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 by individual email communication.

Student Accommodations
Students with accessibility issues or learning accommodations 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

Academic 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. (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

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

Help with eCourseware and email issues
All requests and questions for eCourseware should be directed through the ITS Service Desk at 901.678.8888 or via a service request. ITS will also be able to help with email issues.

Class Schedule

Spring	2021	M50	Calendar
TR			
	19-Jan	Section 1.1	What is/are statistics ?
	21-Jan	Sec 1.2	Sampling
	26-Jan	Section 1.3 & 1.4	Types of statist. studies & should we believe a statistis.study
	28-Jan	Section 2.1	Data types and levels of measurement
	2-Feb	Section 2.2	Dealing with errors
	4-Feb	Section 2.3	Use of Percentages in Statistics
	9-Feb	**Test 1**	**Chapters 1 & 2**
	11-Feb	Sec 3.1& Sec3.2	Frequency Tables &Picturing distributions of data
	16-Feb	Section 4.1 & 4.2	What is average
	18-Feb	Section 4.3 & 4.4	Measures of variation and statistical paradoxes
	23-Feb	Sec 5.1	What is normal?
	25-Feb	Section 5.2	Properties of the normal distribution
	2-Mar	Section 5.2	Properties of the normal Distribution
	4-Mar	**Test 2**	**Chapters 3, 4, 5**
	9-Mar	**Spring Break**	
	11-Mar	**Excel Lab 1**	**Getting Started**
	16-Mar	Section 6.1	The role of probability in statistics
	18-Mar	Section 6.2	Basics of probability
	23-Mar	Sec 6.3 & 6.4	The law of large numbers and ideas of risk and life expectancy
	25-Mar	Sec 6.5	combining probabilities
	30-Mar	Sections 7.1 & 7.2	Seeking correlation and interpreting correlation
	1-Apr	Sec7.3 & Sec 7.4	Best-fit lines and prediction & the search for causality
	6-Apr	**Test 3**	**Chapters 6 and 7**
	8-Apr	**Spring Break**	**Spring Break**
	13-Apr	**Excel Lab 2**	**Sampling**
	15-Apr	Sec 8.1	**Sampling Distributions**
	20-Apr	Sec 8.2& Sec8.3	**Estimating Population Mean**
	22-Apr	Sec 9.1	Fundamentals of hypothesis testing
	27-Apr	**Final Exam**	**Review**
	4-May	**Final Exam**	