MATH 1150 ELEMENTARY STATISTICS **Spring 2018**
Core 8
Mathematics Domain

01 MWF 9:15-10:20 Sullivan-Harrell 307
02 MWF 10:30-11:35 Sullivan-Harrell 307

Instructor
Dr. Alex Rice
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Sullivan-Harrell 364
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Hours (Subject to Change)
Monday 11:45am-12:45pm, Wednesday 2:30-3:30pm
Thursday 10:00-11:30am

Text
Statistics: Unlocking the Power of Data, Lock, http://www.lock5stat.com/

Course Webpage: http://alexricemath.com/math-1150/

Calculators/StatKey
You will be provided a TI-83 calculator as needed for in-class activities, as well as during exams. In addition to the calculators, we may utilize the Stat Key online software, located at http://www.lock5stat.com/StatKey/ . We will cover how to use it as needed.

Course Objectives
The primary objective of the course will be for you to understand how statistics is used and misused in our society. The focus will be on understanding different measures of testing data: how they are used and what they do and/or do not allow you to conclude.

Course Content
This course will include, but not be restricted to, Chapters 1-8 of the text.

Course Prerequisites
This course has very few prerequisites - a minimum ACT mathematics sub-score of 16 or an SAT score of 390, or by petitioning the instructor. The only real prerequisites are an inquisitive mind and willingness to put in the work to think in a new way about numbers and how they relate to the world around us.

American Disabilities Act
If you have any needs or require accommodations related to a disability or learning difference, please contact Patrick Cooper to register with the Office of Disability Services. You can reach him via e-mail at coopeap@millsaps.edu or by calling extension 1228. Accommodations will not be granted until a meeting has taken place with Patrick, letters have been processed, and you have met with your instructor.

Math Tutoring Lab: MW 7:00-8:30, TR 4:00-5:30, Sullivan-Harrell 308

- a free service offered by Millsaps to support students taking mathematics classes
- staffed by students who have shown a proficiency in math
- more useful to students who use it throughout the semester rather than the night before the exam

Homework

Homework assignments will be given on a roughly weekly basis, either via problems out of the textbook or assignments generated by the instructor.

Course Grade

Homework	15%
In-class Quizzes and Activities	20%
Three In-class Exams	15% each
Cumulative Final Exam	20%

Final Grade / Grading Scale

[92, 100] A	[88, 90) B+	[76, 78) C+	[64, 66) D+
[90, 92) A-	[80, 88) B	[68, 76) C	[60, 64) D
	[78, 80) B-	[66, 68) C-	[0, 60) F

Important Dates

January 15	MLK Day, no classes
November 1	Last day for dropping courses with grade of W
March 12-16	Spring Break, no classes

Exam Dates

Wednesday, February 7	Test 1
Wednesday, March 7	Test 2
Wednesday, April 11	Test 3
Friday, April 27 (9-11am)	Cumulative Final Exam (01)
Saturday, April 28 (2-4pm)	Cumulative Final Exam (02)

Information for students in the Core Curriculum:

WRITING: Millsaps College is committed to Writing Across the Curriculum. As part of this commitment each core course is designed to help you develop some specific writing skills. As a Core 8 course, we will emphasize style, evidence, and format as illustrated on the Millsaps College writing pyramid. Consequently, for all assignments in this class, serious consideration must be given to issues of:

Style: Awareness of audience, awareness of purpose, appropriate voice and appropriate grammar.

Evidence: Developing and/or evaluating the sufficiency and competency of evidence for mathematical arguments.

Format: Incorporating appropriate table and graphs as well as evidence of proofreading and global revision.

LIBERAL ARTS ABILITIES: This course will focus on helping you to develop the following liberal arts abilities: reasoning and communication.

Reasoning - the ability to analyze and synthesize arguments, to question assumptions, to evaluate evidence, to argue positions, to draw conclusions, and to raise new questions; varieties of reasoning include quantitative, scientific, ethical, and aesthetic. This course will address the following:

Quantitative (the ability to use mathematical reasoning as a tool of analysis and as a means of conveying information) - In this course you not only will be asked to perform mathematical calculations, you will, more importantly, be asked to interpret the results. The activities are specifically designed to help you develop this liberal arts ability. Through these activities you will demonstrate that you understand the results of specific statistical tests and from these results you can make recommendations on what, if any, changes should be made.

Ethical (the ability to analyze the principles and assumptions of moral claims and to make informed and reasoned moral arguments) - We will spend a great deal of time discussing how statistical tests can be misused in order to distort the truth. Among other things we will look at advertisements which misrepresent the data in such a way as to mislead the consumer. What does it mean that 3 out of 4 dentists surveyed would choose product X? We will analyze what samples ensure an accurate representation of the population and what samples can bias the results. Knowledge of this will help you to be a better consumer - knowing what questions to ask before you are so convinced of a study or a product's worth.

Communication – the ability to express ideas, arguments, and information coherently and persuasively orally and in writing.

In addition to class discussions, you will have to spend a great deal of time writing out your interpretation of the results of a given test. On tests, homework, and assignments you will be asked to write explanations of what tests you ran, why you ran them, give your results, and make recommendations.

Information for students in the Compass Curriculum – Mathematics Domain:

Description - Through this requirement, students will study and solve pure and applied mathematical problems from both visual and analytic perspectives. The courses that satisfy this requirement will develop student's ability to convert conceptual information into problems that can be solved using standard mathematical and geometrical tools, solve the problems, and interpret the results.

Student Learning Goals

• Accurately interpret and explain information presented mathematically and graphically.

Students will interpret graphs of data sets in order to understand the behavior of data (bar charts, pie charts, dotplots, histograms, boxplots, scatter plots, sampling distributions, probability distributions, etc.)

Students will approximate standard deviations, confidence intervals, and p-values from graphs of sampling distributions. Students will then interpret these measurements and explain what the measurements infer (or don't infer) about a population. Students will read excerpts from journal articles and interpret the statistical information contained in these articles.

• Quantify problems, apply abstract symbolic manipulation or reasoning, and interpret the results.

Students will examine data sets and develop questions about the data that may be answered using statistical methods. Students will use symbolic manipulation to calculate appropriate statistics (standard deviation, mean, median, mode, proportion) and/or run appropriate statistical tests (hypothesis tests) and/or make estimates of parameters (confidence intervals). Students will interpret these statistics, test results, and estimates in context.

• Understand how the computational skills taught apply in contexts both within and outside mathematics.

Students will examine real world data sets, work through example and homework problems, and read journal articles pulled from a wide variety of fields.

• Explicitly describe assumptions in estimation, modeling or data analysis and make appropriate inferences with critical thinking.

Students will study confidence intervals, hypothesis tests, and linear regression. Students will be expected to correctly describe assumptions, interpret their results, and clearly express these inferences in written form.

• Develop and interpret mathematical models of raw data or physical or social phenomena.

Students will develop linear regression models and sampling distributions for raw data. Students will interpret many statistics associated with linear regression and sampling distributions (slope, coefficient of correlation, ANOVA, p-values, confidence intervals, etc.)

Information for students in the Compass Curriculum – STEM Domain:

Description - Students need to be able to make sense of the world using rapidly-changing information and technology. In the future, they will certainly deal with problems not previously encountered and be required to evaluate new situations, new phenomena, and new data. In the
Millsaps STEM (Science, Technology, Engineering, and Mathematics) Experience, innovation and the acquisition of new knowledge are valued. Furthermore, the focus is on assessing and applying the new knowledge.

Student Learning Goals

• Explore the interconnected nature of science, technology, engineering, and mathematics and see how they are practiced in applied contexts.

Students will discover that disciplines that use data (mathematics, the natural sciences, social sciences, business, etc.) are connected by the need to accurately interpret that data using statistical methods. Thus, both the language and practice of statistics are used across all components of the STEM domain.

• Understand and accurately explain scientific problems and information presented quantitatively.

Students will interpret quantitative information through the use of confidence intervals, hypothesis tests, and linear regression models. Students will be expected to clearly express these interpretations in written form.

• Focus on application of STEM content.

Elementary Statistics is an applied mathematics course. In this course students will use technology (graphing calculators as well as statistical software and websites) to aid in graphing, summarizing, and testing data sets. Students will examine real world data sets, work through example and homework problems, and read journal articles pulled from a wide variety of STEM fields.

• Formulate research questions and draw conclusions about research studies.

Students will examine data sets and develop questions about the data that may be answered using statistical methods. Students will calculate appropriate statistics (standard deviation, mean, median, mode, proportion), run appropriate statistical tests (hypothesis tests), and make estimates of parameters (confidence intervals). Students will interpret these statistics, test results, and estimates in context.

Honor Code

Millsaps College is an academic community dedicated to the pursuit of scholarly inquiry and intellectual growth. The foundation of this community is a spirit of personal honesty and mutual trust. Through their Honor Code, the students of Millsaps College affirm their adherence to these basic ethical principles.

An Honor Code is not simply a set of rules and procedures governing students' academic conduct. It is an opportunity to put personal responsibility and integrity into action. When students agree to abide by an Honor Code, they liberate themselves to pursue their academic goals in an atmosphere of mutual confidence and respect.

The success of the Code depends on the support of each member of the community. Students and faculty alike commit themselves in their work to the principles of academic honesty. When they become aware of infractions, both students and faculty are obligated to report them to the Honor Council, which is responsible for enforcement. A representative, but not exhaustive, list of academic offenses and violations covered by the Millsaps Academic Honor Code is provided at http://www.millsaps.edu/academics/honor_code.php.

The pledge signed by all students upon entering the College is as follows:
As a Millsaps College student, I hereby affirm that I understand the Honor Code and am aware of its implications and of my responsibility to the Code. In the interests of expanding the atmosphere of respect and trust in the College, I promise to uphold the Honor Code and I will not tolerate dishonest behavior in myself or in others.

Each examination, quiz, or other assignment that is to be graded will carry the written pledge: **"I hereby certify that I have neither given nor received unauthorized aid on this assignment. (Signature)"** The abbreviation **"Pledged"** followed by the student's signature has the same meaning and may be acceptable on assignments other than final examinations.

It is the responsibility of students and faculty to report offenses to the Honor Code Council in the form of a written report. This account must be signed, the accusation explained in as much detail as possible and submitted to the Dean of the College.

The Honor Council, 2017–2018

Students:	Faculty:
Patrick Davis, Chair	Dr. Lynn Raley (Fall) / Dr. David Wood (Spring) - Faculty Advisor
DJ Hawkins, Vice Chair	Dr. Blakely Fender
Lillian-Lee Broussard	Dr. Nathan Shrader
Emma Carter	

Policies of the Instructor

- The student is responsible for material/information covered and assignments given during an absence.

- If your score on the cumulative final exam is higher than the lowest of your three in-class exam scores, your final exam score will replace that lowest score.

- Make-up exams will only be given in the event of a college-related obligation or a serious, documented medical emergency.

- Any *violation of the Millsaps Honor Code* will be reported to the Honor Council. This includes (but is not limited to): cheating, plagiarism, lying, submitting someone else's work as your own, submitting work which you do not understand (in the case of group projects), and unauthorized assistance on any assignment which will be graded. See http://www.milsaps.edu/academics/honor code.php

- *Cell phones and similar devices* are to be silent and put away during class. *Laptops* are to be closed, unless specifically directed otherwise.

- *Class communications* will be made by Millsaps e-mail. It is your responsibility to check your account.

- *Content of this syllabus* is subject to change by the instructor.

TENTATIVE SCHEDULE (SUBJECT TO CHANGE)

Week	Monday	Wednesday	Friday
1/17-1/19	MLK	SNOW	1.1
1/22-1/26	1.2, 1.3	2.1, 2.2	2.3
1/29-2/2	2.4	2.5	2.6
2/5-2/9	Review	TEST 1: Ch 1-2	3.1
2/12-2/16	3.2	3.3	3.4
2/19-2/23	4.1	4.2	4.3
2/26-3/2	4.4	4.4/4.5	4.5
3/5-3/9	Review	TEST 2: Ch 3-4	5.1
3/12-3/16	SPRING	BREAK	
3/19-3/23	5.1	5.1/5.2	5.2
3/26-3/30	6.1, 6.2	6.3, 6.4	6.5, 6.6
4/2-4/6	6.7, 6.8	6.9, 6.10	6.11, 6.12
4/9-4/13	Review	TEST 3: Ch. 5-6	7.1
4/16-4/20	7.2	8.1	8.2
4/23	Review		

FINAL EXAMS: Section 01 (9:15-10:20): Friday 4/27, 9:00-11:00am
Section 02 (10:30-11:35): Saturday 4/28, 2:00-4:00pm