Framingham State University

STAT 117 – INTRODUCTION TO STATISTICS

Course Information

Semester	: Summer 2021 (June 28th. - July 30th., 2021)
Credit	: 4
Teaching Hours	: 50 Hours
Location	: Online
Professor Name	: TBD
E-mail	: TBD

Course Description:

An introduction to the discipline of statistics, emphasizing both statistical thinking and its application to analyzing data. Topics include sampling, design of experiments, organizing and exploring data, probability distributions such as the normal distribution, sampling distributions, hypothesis testing and confidence intervals, correlation and regression. Students are expected to express results of statistical procedures in ordinary non-technical language. Real world applications of statistical topics are emphasized throughout the course. Note: Students may not receive credit for both this course and STAT 107 Business Statistics or STAT 157 Probability and Statistics or STAT 208 Biostatistics. Prerequisite: Satisfactory score on the mathematics placement examination.

This course covers the essentials of statistics. Students learn descriptive and inferential statistics; charts (histograms, frequency polygons, ogives, and pie charts); measures of central tendency (mean, median, mode, and weighted mean); and measures of dispersion (range, variance, and standard deviation). Additional areas of study include discrete and continuous random variables; basic probability theory; the binomial distribution and its application in binomial experiments; standard and non-standard normal distributions; the Central Limit Theorem; confidence intervals for means, proportions, and variances; linear correlation and regression; and the one sample hypotheses test for mean (large and small sample), proportions, and variances.

Course Goal:

To provide the student with a basic understanding and working knowledge of elementary statistics as it applies to every day life.

Required Textbook/Materials/Website:

Textbook: *Elementary Statistics*, by Triola, Pearson Publishing, 13th edition,© 2018

MML Access Code: (comes with new textbook or can be purchased separately)
MML Course ID: sheiba31232
Materials: Graphing calculator is strongly recommended – TI 83/84
Website: Access to www.mymathlab.com

Student Learning Outcomes & Instructional Objectives:

This course is designed to achieve the following student outcomes and objectives:

- Interpret and build Frequency distributions
- Interpret and build Frequency tables
  - o   histograms, frequency polygons, ogives and pie charts
- Calculate and interpret Measures of Center
  - o   mean, median, mode,
  - o   weighted mean
  - o   mean of a frequency table
- Calculate and interpret the Measures of variation
  - o   range
  - o   standard deviation and variance of samples and populations
  - o   the empirical rule
  - o   Chebyshev's theorem
- Calculate the measures of Relative Standing
  - o   z-scores
  - o   percentiles and quartiles
  - o   boxplots
- Introduction to Probability
  - o   the complement rule
  - o   addition rule of probability
  - o   multiplication rule
  - o   conditional probabilities
  - o   applications
- Discrete Probability Distributions
  - o   discrete random variables
  - o   mean, standard deviation and variance
  - o   mathematical expectation
- Binomial Distribution
  - o   binomial probability formula and its applications
  - o   computing the mean and the standard deviation of a binomial distribution
- Standard Normal Distribution
  - o   z-scores and normal distribution probabilities with applications
  - o   non-standard Normal Distributions: applications
  - o   Central Limit Theorem: applications (sample means)
  - o   normal approximation to binomial (if time permits)
- Estimating Population Proportions
  - o   estimators

- critical values and confidence level
- margin of error
- confidence intervals
- calculating sample size for a given margin of error and confidence level
- Estimating the mean
  - estimators
  - critical values: sigma known
  - critical value: sigma unknown. The t distribution
  - confidence intervals (SIGMA known and unknown)
- Estimating the variance
- Hypothesis testing: Proportions
  - H_0, H_1 and significance level
  - sample's test statistic
  - using P-value and critical value to test hypothesis.
  - conclusions
  - errors: alpha and beta (if time permits)
- Testing hypothesis about the mean
  - H_0, H_1 and significance level
  - sigma unknown: critical t values. P-values (using technology)
  - conclusions
  - errors (if time permits)
- Testing hypothesis about the variance
- Correlation
  - calculation and meaning of the correlation coefficient
  - coefficient of determination
  - testing for correlation in the population using Pearson's table
- Regression
  - the regression line
  - calculating the slope and intercept of the regression line
  - using the regression line for prediction when appropriate

Teaching Procedures:
This Course be delivered synchronously via zoom (at a schedule time, once a week) and asynchronously (materials reviewed on student's own schedule) on blackboard and MyMathlab. Recorded zoom meetings will be saved and posted on Bb for later review. In addition, video links and power point slides would emailed to students prior to scheduled zoom lecture. You will be given homework assignments on MyMathLab to be completed by the due dates/times each week.

Course Topics & Required Assignments/Readings:

Exploring Data with Tables and Graphs
- Frequency Tables
- Histograms and Graphs

Describing, Exploring, and Comparing Data
- Measures of Center
- Measures of Variation
- Relative Standing

Probability
- Introduction to Probability
- Addition, Complement, and Multiplication Rules
- Conditional Probability

Discrete Probability Distributions
- Discrete Probability Distributions
- Binomial Probability Distributions

Normal Probability Distributions
- The Standard Normal Distribution
- Non-standard Normal Distributions
- Central Limit Theorem
- Normal Approximation to Binomial (if time permits)

Estimating Parameters and Determining Sample Sizes
- Estimating a Population Proportion
- Estimating a Population Mean
- Estimating Population Variance (if time permits)

Hypothesis Testing
- Basics of Hypothesis Testing
- Testing a Claim About a Proportion
- Testing a Claim About a Mean where Sigma is Unknown

Correlation and Regression
- Correlation
- Regression

Assessment

Students will be assessed in various ways, including quizzes, exams, homework, and a cumulative final exam. Remember, your written work is a reflection of your effort in this course and therefore, all work is to be written legibly, with scratch work done on separate paper if necessary.

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Tentative Assignments/Quizzes/Tests Schedule

June 28	Introduction
6/28-7/4	Chapt 6 & 7
6/30-7/4	Chapt 6 & 7
7/2-7/4	*Quiz 1*
July 5	Chapt 8
7/5-7/11	Chapt 8
7/7-7/11	*Quiz 2*
7/9-7/11	*Test 1*
July 12	Chapt 9
7/12-7/18	Chapt 9
7/14-7/18	*Quiz 3*
7/16-7/18	*Test 2*
July 19	Chapt 10
7/19-7/25	Chapt 10
7/21-7/25	*Test 3*
July 26	Chapt 11
7/26-7/30	Chapt 11
7/30	*Final Exam*

What chapters will be on the Exams?	
Test 1	Chapters 6, 7
Test 2	Chapters 8, 9
Test 3	Chapters 9, 10
Final Exam	Comprehensive – July 30th

Grading Breakdown:

35% - Homework
15% - Three Quizzes (No Make Up but will drop the lowest at the end of the semester)
25% - Three Tests (No Make Up but will drop the lowest at the end of the semester)
25% Cumulative Final Exam (No Make Up)

A	95 – 100	B –	80 – 82	D +	67 – 69
A –	90 – 94	C +	77 – 79	D	63 – 66
B +	87 – 89	C	73 – 76	D –	60 – 62
B	83 – 86	C –	70 – 72	F	0 – 59

Attendance, Student Responsibilities and Expectations

- **E-Textbook**: All required for this course, MATH 220 is the e-textbook via MyMathLab.
- **Homework** assignments, quizzes and tests will be, assigned and graded on MyMathLab. Students are able to see their scores and progress directly on MML anytime via the Gradebook.
- You would receive emails and brief announcements via MyMathLab and Blackboard on a regular basis to keep you informed of what you should be working on.
- Weekly emails will be sent to students who may be falling below average as a wakeup call and remind them of help options available for catching up to expectations.
- **3 Quizzes**: Two attempts with the option to review the first attempt before taking the second attempt.
- **3 Tests:** Only one attempt with a possibility of reviewing after the due date. However, if a student's test is disrupted due to possible technology issues he/she must contact me immediately for a possible reset in at least two hours before it expires.
- **Final Exam**: Only one attempt and could not be reviewed after submission. However, if a student's exam is disrupted due to possible technology issues he/she must contact me immediately for a possible reset at any time during the testing period. To minimize improper assistance during tests/final exam, students are expected to take test/exam at the same time/date while logged into zoom with audio/video turned on and would try confirm any technological disruptions whenever they may occur.
- Students should NOT use calculators to integrate or differentiate.
- Homeworks will be assigned progressively. It is important that students keep on top of the course material, so homework must be done when assigned. Please note that completion of all homework assignments in a timely manner is necessary to reinforce the skills learned in class that day.
- Missing an exam is a *serious* matter. In the event a student must miss an exam because of circumstances beyond his/her control, it is imperative that the student contacts the instructor before the scheduled exam, or before the next class

following the exam. Once a graded exam has been returned to the class, it is not possible for a student to make it up.

• Class participation and attentiveness to the pace of this course will be considered an integral part of this course.

Disability Statement:

"Framingham State University offers equal opportunities to all qualified students, including those with disabilities and impairments. The University is committed to making reasonable accommodations as are necessary to ensure that its programs and activities do not discriminate, or have the effect of discriminating, on the basis of disability. Academic Support serves students with learning and psychiatric disabilities as well as students with visual, mobility and hearing impairments. For further information about this, please visit the website at https://www.framingham.edu/academics/center-for-academic-success-andadvising/ or contact Ms. LaDonna Bridges, Director of Academic Support/Disability Services, in the Center for Academic Support and Advising (CASA) at 508-626-4906 or lbridges@framingham.edu."

Academic Honesty and Plagiarism:

Our purpose in the classroom is to seek the truth; this work requires trust and honesty between teacher and student. If we are not honest about what we know and don't know, our learning will always be impaired. Because our teaching and learning depends on this honest communication, we expect all students to understand what plagiarism is and why it is unacceptable.

Plagiarism means taking someone else's ideas or words and presenting them as one's own. The offense can take many forms including cheating on a test, passing in a paper taken from the Internet or from another student, or failing to properly use and credit sources in an essay. Sometimes the issue is subtle, involving getting too much help on an assignment from someone else. In every instance, plagiarism means cheating both oneself and the owner of the source. Since the cheating sabotages a student's learning experience, consequences range from no credit for the assignment to failure for the course and possible expulsion from the college.

For further information concerning plagiarism, refer to the FSU Student Handbook.

Copyright Law

U.S. Copyright Law - For all courses that use Blackboard, please include the following statement on your syllabus: "This course website may contain copyrighted materials that are used in compliance with U.S. Copyright Law. Under that law, materials may not be saved to your computer, revised, copied, or distributed without permission. They are to be used in support of instructional activity as part of this course only and shall be

limited to the duration of the course, unless otherwise specified by the instructor or owner of the material. You may only download or print materials at the direction of your instructor who knows which materials are copyrighted and which are not."

Frequently Asked Questions by Students:

- *Can I turn in late homework?*
  - Yes, you can. But there is a 30% reduction in your potential earned points for the questions that are past due. Also, homework assignments will not remain available for the entire semester. Once an exam is given, the homework assignments that cover the exam's material will be closed for the remainder of the semester.
- *Can I make up a missed quiz?*
  - No, you cannot take a missed quiz, no matter what the reason. However, the lowest quiz score will be dropped at the end of the semester.
- *Can I make up a missed test?*
  - No, you cannot take a missed test, no matter what the reason. However, the lowest quiz score will be dropped at the end of the semester.
- *Do you give "retakes" on tests or quizzes?*
  - No, I do not. You only get one (1) chance at each quiz or each test.
- *Do you give Extra Credit in this course?*
  - This question often gets asked towards the end of the semester. No, extra credit is *not* given for this course. To earn the highest possible grade, you should read your textbook, complete all homework assignments on time, be ready for quizzes and exams. You will not be allowed to do extra work to boost your grade.
- *What are the consequences for cheating?*
  - Failure of the quiz or test. Or worse – failure of the course. Simply don't cheat.
- *What should I do if I'm struggling with my homework?*
  - Email me right away, by clicking on the "Ask Your Teacher" link on MyMathLab. I will reply as quickly as I can.
  - Watch YouTube videos. Search for what you're struggling with.
- *Can any calculator be used for this course?*
  - In short, yes, any calculator can be used for this course. However, you'll find that a graphing calculator will be very helpful to you, requiring less memorization of formulas, although formulas can/will be provided if needed. The professor will be using the TI-83/84plus throughout this course, and showing students how to use it in class.