

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 155 *Modern Statistics with Computer Analysis*

- Objective:** To introduce the concepts of statistical inference by way of both non-parametric methods and classical parametric methods.
- Intended for:** Students in the social sciences and natural sciences who must make inferences from sample data.
Credit may not be received for more than one: MATH 151, 155 or 213.
- Prerequisite:** High School Algebra II and Plane Geometry.
- Textbook:** "A First Course in Statistics," by McClave and Sincich; Prentice Hall, 10th edition, 2009.
 ISBN: 978-0-13-615259-0
- Technology:** THIS COURSE IS COMPUTER DEPENDENT. MINITAB will be used throughout the course.

	Weeks
Chapter 1: <i>Statistics, Data, and Statistical Thinking</i> The science of statistics, its applications, fundamental elements of statistics, data (Types, collection, and method of collection)	.5
Chapter 2: <i>Methods for Describing Sets of Data</i> Qualitative Data, Graphical Method, Summation Notation, Numerical Measures of Central Tendency; Variability; and Relative Standing, Interpreting the Standard Deviation and Outliers	2.0 - 2.5
Chapter 3: <i>Probability</i> (Sections 1-6) Events, Sample Spaces, Probability, Unions, Intersections, Complementary Events, Additive Rule and Mutually Exclusive Events, Conditional Probability, Multiplicative Rule and Independent Events	1.0 - 1.5
Chapter 4: <i>Random Variables and Probability Distributions</i> Random Variables, Probability Distributions for Discrete and Continuous Random Variables, Binomial Random Variables, Normal Distribution, Normal Probability Plot, Sampling Distribution and Central Limit Theorem	3.5
Chapters 5-6: <i>Estimation and Hypothesis Tests Based on Single Samples</i> Confidence Interval For a Population Mean (small and large sample), Determining the Sample Size, Test of Hypothesis About a Population Mean (large and small), P-Values, (Also include Wilcoxon Signed Rank Test)	3.0
Chapter 7: <i>Comparing Population Means</i> (Sections 1-5) Comparing two Population Means: Independent Sampling and Paired Difference Experiments, Nonparametric Tests for Comparing Two Populations: Independent Sampling and paired Difference Experiments, Note: <i>Wilcoxon Rank Sum Test is equivalent to the Mann Whitney U Test</i>	2.0
<i>Optional Topics</i> (if time permits) Tests for Proportions, Chi-Square	1.0
<i>Tests</i>	1.0

EVALUATION

Quizzes/homework/lab work	15 - 25%
Critique*	4 - 8%
Tests (2 or 3)	40 - 60%
Final exam (comprehensive) [†]	20 - 40%

*Students will write a critique of an article which uses statistical inference. Instructions as to the form of this critique will be supplied by the instructor. The critique may be counted as part of the final exam.

[†]80% of the final exam is a common, multiple-choice component; 20% is a writing assignment determined by the instructor.

Free tutoring is available for this course in the Spring and Fall semesters.

NOTE: Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.