



PROBABILITY AND STATISTICS

Revised 8/3/2011

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COURSE NUMBER: MAT 120

PREREQUISITE(S): MAT 102 or 153 with a grade of “C” or higher, or placement

CO-REQUISITE(S): None

COURSE DESCRIPTIONS

This course includes the following topics: introductory probability and statistics, including organization of data, sample space concepts, random variables, counting problems, binomial and normal distributions, central limit theorem, confidence intervals, and test hypothesis for large and small samples; types I and II errors; linear regression; and correlation.

TEXTBOOK(S): Larson, Ron and Farber, Betsy: Elementary Statistics, 5th ed., Prentice Hall, 2012.
(with MyStatLab/MyMathLab Student Access Kit)

Textbook ISBN: 0321693620
Standalone MSL Access Kit ISBN: 0321694643

REFERENCE(S): N/A

OTHER REQUIRED MATERIALS, TOOLS, AND EQUIPMENT:

Calculator: Texas Instrument, TI-83 Plus or TI-84.
Calculators with algebraic symbolic operations are not allowed without instructor’s approval.

For most recent requirements go to :
<http://info.coursecompass.com/website/support.html>

Computer with Internet access, Internet Explorer 5.0 or higher or other current browser, Java, word processing software (must be able to save Word format), and anti-virus software.

METHOD OF INSTRUCTION:

This course will be taught via the internet. The concepts will be instructor-led by reading, watching, and/or exploring using an internet-based math tutorial and a textbook.

GRADING SYSTEM:

90 - 100 = A
80 - 89 = B
70 - 79 = C
60 - 69 = D
Below - 60 = F

GRADE CALCULATION METHOD:

See instructor's handout.

CONFIDENTIALITY:

All students' e-mail addresses may be available to other students in the class. Although some assignments in an online course may encourage or require peer communication, the instructor will make every effort to protect the confidentiality of any personal communication (for example, grades). However, you should recognize that e-mail and other electronic media are not secure; there is no guarantee of the privacy of your e-mail or other personal information.

APPROPRIATE ONLINE BEHAVIOR:

The use of Spartanburg Community College's website, e-mail service or course management software for creation and/or distribution of material not pertaining to course participation is prohibited and is grounds for dismissal according to College policy under "disruptive behavior." Such actions, include, but are not limited to:

- Inappropriate use of email and discussion boards for:
 - ✓ Harassment
 - ✓ Unlawful solicitation
 - ✓ "Spamming"
 - ✓ "Flaming"
- Use of online editing tools within the course management software to:
 - ✓ Create offensive material
 - ✓ Link to inappropriate materials

**ATTENDANCE
POLICY:**

Requirement: All students must register in MyStatLab during the first week of scheduled classes. At the end of the first week, the instructor will drop any student from the course who has not registered in MyStatLab.

Instructors maintain attendance records. However, it is the student's responsibility to withdraw from a course. A student who stops attending the online class and fails to initiate a withdrawal will remain on the class roster. *With this in mind, for every assignment, test or exam not completed while still enrolled in the course the student will receive a grade of zero and the final course grade will be calculated accordingly.*

Withdrawal Policy: During the first 75% of the course, a student may initiate withdrawal and receive a grade of W. A student cannot initiate a withdrawal during the last 25% of the course. Extenuating circumstances require documentation and approval by the appropriate department head and academic dean.

**ACADEMIC
CONDUCT:**

ACADEMIC DISHONESTY: Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

TESTING:

Tests will be taken online in approved Testing Centers with proctors. The instructor may allow, at most, one test to be taken online unproctored. For SCC students, tests will be taken online and will be administered in the **Testing Center located in E-3 of the East Building on the SCC campus.** If the SCC campus is not convenient, the student may contact the instructor for an alternate testing site. For Tech Online students, the test will be administered in the testing center at your host college. Refer to the class outline for test availability. If any test is not taken during the specified time frame, a zero will be awarded for the test

grade. Everyone must take a comprehensive final exam.

**East Building Room 3 Testing Center: PHOTO ID
REQUIRED!**

Go to <http://www.sccsc.edu/resources/testing> for
hours of operation.

ACCOMMODATIONS: Students who need special accommodations in this class because of a documented disability should notify Student Disability Services. You may contact Student Disability Services by calling, (864) 592-4811, toll-free 1-800-922-3679; via email through the Spartanburg Community College web site at <http://www.sccsc.edu/resources/disabilities> ; or by visiting the office located in the Dan Lee Terhune Student Services Building, room 112 of the Spartanburg Community College campus. By contacting Student Disability Services early in the semester, students with disabilities give the College an opportunity to provide necessary support services and appropriate accommodations.

**COURSE OUTCOMES
& OBJECTIVES:**

Upon satisfactory completion of this course, the students should be able to demonstrate competency in the General Education Outcome listed as “their ability to express themselves effectively in quantitative and qualitative terms” in the following competencies and objectives:

- I. Organize and graphically present statistical data.
 1. Construct histograms and stem-and-leaf plots. (frequency polygon, ogive, dot plot, pie chart, Pareto chart)
 2. Interpret graphs correctly.
- II. Calculate measurements of central tendency, variation and position.
 1. Calculate mean, median, and mode.
 2. Calculate standard deviation and variance of data.
 3. Construct box-and-whisker plots using quartiles.
- III. Calculate probabilities.
 1. Construct the sample space for an experiment.
 2. Calculate probabilities using the addition and multiplication rules.
 3. Calculate the number of possibilities using the combination or permutation formula as appropriate.
 4. Calculate mean and standard deviation for probability distributions.
- IV. Calculate probabilities for discrete probability distributions and binomial distributions.
 1. Construct a discrete probability distribution.
 2. Define binomial experiments.
 3. Calculate probability of r successes for n trials for binomial probability distributions.
 4. Calculate the mean and standard deviation for the binomial distribution.
- V. Apply the normal distribution to calculate areas under the curve.
 1. Apply the Empirical Rule for normal distributions.
 2. Standardize scores and compare using Z-scores.
 3. Calculate areas under the standard normal curve.
 4. Calculate areas under any normal curve.

- VI. Apply sampling techniques.
 - 1. Apply the Central Limit Theorem to sampling distributions.
 - 2. Calculate probabilities for sampling distributions.

- VII. Determine confidence intervals for the mean.
 - 1. Construct confidence intervals for large samples.
 - 2. Construct confidence intervals for small samples.

- VIII. Test hypothesis with one sample for the mean.
 - 1. Set up statistical tests for different claims.
 - 2. Test hypothesis for large samples.
 - 3. Test hypothesis for small samples.

- IX. Determine linear regression measures and correlation.
 - 1. Check paired data for linear regression by plotting.
 - 2. Calculate the linear correlation coefficient.
 - 3. Calculate the linear regression equation.

**SYLLABUS
ADDENDUM**

COURSE TITLE: PROBABILITY AND STATISTICS

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COURSE CALENDAR:

I.	Introduction to Statistics	(Chapter #1)	(3hrs.)
	A. Overview	1.1	
	B. Data Classification	1.2	
	C. Data Collection and Experimental Design	1.3	
II.	Descriptive Statistics	(Chapter #2)	(10 hrs.)
	A. Frequency Distributions and Graphs	2.1-2.2	
	B. Measures of Central Tendency	2.3	
	C. Measures of Variation	2.4	
	D. Measures of Position	2.5	
III.	Probability	(Chapter #3)	(5 hrs.)
	A. Basic Concepts	3.1	
	B. Conditional Probability & the Multiplication Rule	3.2	
	C. Addition Rule	3.3	
	D. Additional Topics	3.4	
IV.	Discrete Probability Distributions	(Chapter #4)	(4 hrs.)
	A. Probability Distributions	4.1	
	B. Binomial Distributions	4.2	
V.	Normal Probability Distributions	(Chapter #5)	(7 hrs.)
	A. Introduction to Normal Distributions & The Standard Normal Distribution	5.1	
	B. Finding Probabilities	5.2	
	C. Finding Values	5.3	
	D. Central Limit Theorem	5.4	

VI.	Confidence Intervals	(Chapter #6)	(3 hrs.)
A.	Confidence Intervals for the Mean (large samples)	6.1	
B.	Confidence Intervals for the Mean (small samples)	6.2	
VII.	Hypothesis Testing with One Sample	(Chapter #7)	(5 hrs.)
A.	Introduction to Hypothesis Testing	7.1	
B.	Hypothesis Testing for the Mean (large samples)	7.2	
C.	Hypothesis Testing for the Mean (small samples)	7.3	
VIII.	Correlation and Regression	(Chapter #9)	(3 hrs.)
A.	Correlation	9.1	
B.	Linear Regression	9.2	