SOUTHERN UNIVERSITY AND A&M COLLEGE
DEPARTMENT OF MATHEMATICS

MATH 274
ELEMENTARY STATISTICS

I. DESCRIPTIVE INFORMATION

A. Course Number: MATH 274

B. Course Title: Elementary Statistics I

C. Catalog Description: Course is an introduction to basic descriptive analysis and mathematical concepts commonly used in Statistics. Topics discussed are frequency distribution tables & graphs; measures of central tendency, dispersion, & position; probability, probability distributions (Binomial & Normal); Central Limit Theorem, Correlations, and Regression.

D. Instructor's Emphasis: Basic descriptive analysis and mathematical concepts commonly used in statistics are emphasized in the course. Topics discussed are descriptive data analysis; measures of central tendency, dispersion, and position; probability; counting rules; normal and binomial distributions; and correlations. Data sets are obtained from resources of Learners' perspective disciplines, Bureau of Labor Statistics, U.S. Census and/or various sites on the Internet for analyses with emphasis on interpretations of statistical results.

E. Credit Hours: 3 hours

F. **Prerequisite**: None

G. **Intended Audience:** Course is geared for those learners, except mathematics and engineering majors, who need to satisfy their curriculum. These learners are exposed to the best teaching practices and several teaching strategies. Multicultural education is embraced allowing for global perspectives of statistical concepts.

H. Professor

I. Office Hours:

II. SPECIFICATION OF COURSE GOALS AND LEARNING OUTCOMES

A. Statement of General Goals:

1. LEARNERS WILL DISCOVER ASPECTS OF DESCRIPTIVE STATISTICS IN PROBLEM-SOLVING SITUATIONS AND BE INFORMED USERS OF INFORMATION THEY ENCOUNTER IN REAL LIFE.

2. LEARNERS WILL FACILITATE PROBLEM-SOLVING INVESTIGATIONS TO UNDERSTAND THE BASIC SKILLS NEEDED TO DESIGN AND EXECUTE EXPERIMENTS IN UNDERGRADUATE RESEARCH CLASSES AND REAL WORLD SITUATIONS.

B. Statement of Course Learning Outcomes: Upon completion of this course,

1. Learners will be able to identify and categorize real life situations as they relate to areas of Statistics: population and samples, parameters and statistics, observational and experimental studies by **(a)** defining terms orally and in writing, **(b)** expounding on real life situations in guided lectures and **(c)** other frequent feedback opportunities.

2. Learners will demonstrate knowledge and competence of levels of measurement, types of data, and sampling methods by taking an active part in frequent classroom drills and solving assigned challenges.

3. Given real data (grouped & ungrouped), learners will be able to **(1)** compute some very basic statistical measures [central tendency, dispersion, & position], **(2)** construct frequency distribution tables, and **(3)** demonstrate an understanding of the various statistical calculations by **(a)** describing data and **(b)** interpreting solutions of various statistical graphics [i.e. pie charts, histograms, box & whisker plots, & bar charts] through drills, discovery learning (small groups) and hands-on statistics laboratory assignments.

4. Learners will be able to **(1)** determine probabilities associated with areas under the bell shaped curve, **(2)** interpret those probabilities, and **(3)** understand the circumstances surrounding the normal random variable by **(a)** providing a model of its distribution, **(b)** presenting graphical/numerical information about the variable and **(c)** presenting the methodology during frequent feedback discussions, hands-on computer laboratory exercises and doing assignments.

5. Learners will be able to **(1)** determine whether two variables are linearly correlated, **(2)** identify a graph associated with such, and **(3)** interpret the results of the correlation coefficient and the regression line by **(a)** utilizing Internet applet activities that help to reinforce such principles and **(b)** doing assigned challenges.

6. Learners will demonstrate competence when utilizing statistical packages such as SPSS, StatDisk, and/or Microsoft Excel to analyze data, by interpreting the results of computer printouts and through written exercises/exams.

7. Learners will be able to identify probabilistic experiments (binomial & normal) and understand what laws of probability are appropriate for solving these challenges by showcasing such solutions with interpretations on the board, in reports, and through written exercises/exams.

8. Learners will understand properties of the standard normal distribution and exhibit such by **(a)** sharing with the class the area under the normal curve given z-values or specific data values, and **(b)** identifying distributions as symmetric or skewed using technology such as the Internet.

9. Learners will demonstrate their comprehension of the central limit theorem to solve problems involving sample means for large samples by frequent feedback opportunities and blackboard displays/exercises.

C. Statement of Course Content:

Chapter 1 **The Nature of Probability and Statistics [**Descriptive versus Inferential Statistics, Variables and Types of Data, Data collection and Sampling Techniques & Observational and Experimental Studies]
http://www.random.org/nform.html AND http://www.random.org/sform.html

Chapter 2 **Frequency Distributions and Graphs** [Organizing Data; Histograms, Frequency Polygon, and *Ogives (optional)*, & Other Types of Graphs]

Chapter 3 **Data Description [**Measures of Central Tendency, Measures of Variation, & Measures of Position; (Exploratory Data Analysis)

Chapter 4 **Probability and Counting Rules [**Sample Spaces and Probability, The Addition Rules for Probability, The Multiplication Rules and Conditional Probability, & Counting Rules]

Chapter 5 **Discrete Probability Distributions** [Probability Distributions, Mean, Variance, and Expectation, The Binomial Distribution]

Chapter 6 **The Normal Distribution** [Properties, The Standard Normal, Applications, The Central Limit Theorem, & The Normal Approximation to the Binomial]
http://www.stat.sc.edu/~west/javahtml/CLT.html

Chapter 10 **Correlation and Regression** [Scatter plots, Correlation, & Regression]
https://netfiles.uiuc.edu/jimarden/www/GCApplet/index_old.html
http://bcs.whfreeman.com/ips4e/cat_010/applets/CorrelationRegression.html
http://www.finitemathtutor.com/Correlation/index.html

III. READINGS

A. Textbook: Bluman, A. G. (2012) *Elementary Statistics: A Step by Step Approach*, 8th (or slightly older) Edition, McGraw-Hill Company

This textbook is REQUIRED for each Learner. Possess: *Elementary Statistics: A Step by Step Approach*, textbook, during ALL sessions.

B. Supplementary books:

Johnson & Kuby. (2007) *Elementary Statistics.* 10th Edition, Thomson Brooks/Cole Publisher

McClave & Sincich. (2003) *Statistics*, 9th Edition, Prentice Hall Publisher

Triola. (2003) *Elementary Statistics, 3rd edition,* Addison-Wesley Publishing
http://occawlonline.pearsoned.com/bookbind/pubbooks/triola_awl/chapter1/deluxe.html

C. Web Sites:

Data Analysis and Probability
http://standards.nctm.org/document/chapter3/data.htm

The Mathematical Association of America (MAA)
http://www.maa.org/

IV. DESCRIPTION OF INSTRUCTIONAL PROCEDURES

Guided Lecture	45%
Discovery Learning (small groups)	20%
Hands-on (Minds on) calculator & stat lab	15%
Immediate/Frequent Feedback Opportunities	20%

V. COURSE REQUIREMENTS

A. Academic

Each learner enrolled in this course has set expectations!

1) Possess a scientific calculator during ALL sessions: **TI-83/84/84 Plus//TI-89/TI-Nspire OR Casio Algebra FX 2.0** can be used in class. (Learner is responsible for learning how to use the calculator of their choice. Class demos will be based on TI-84 TI Learner can download instructions from www.casio.com [click on USA, support, and manuals] or http://www.ti.com/calc/ for Texas Instrument (TI) calculator help.
http://www.watchmeware.com/ti89tutor.html

2) Take and pass chapter examinations covering 1 - 6 & 10.

3) Complete all assignments.

4) **LIVETEXT** subscription is required.

Southern University and A&M College-Baton Rouge has entered into partnership with LiveText, Inc. to provide online academic resources for student collaboration and learning outcomes assessment. Therefore, all students enrolled in this course are required to purchase a subscription from LiveText, Inc. through the Southern University Bookstore. LiveText, Inc. provides students with the electronic tools and services needed to serve them in their courses and in their career or academic pursuits beyond graduation.

LIVETEXT is a dynamic tool that will enable you to:

Create Electronic Portfolios for storing and displaying coursework for use anytime and anyplace;

Share your résumés, professional portfolios and virtually any projects that can be photographed, video recorded, and uploaded to prospective employers and others who need or want to know about your accomplishments;

Engage in discussion boards with other students, exchange feedback, and create study groups and other types of social networks.

Complete assignments in key/required courses where LiveText has been embedded (without LiveText, you will not be able to complete these assignments).

Create a complete record of your academic career that is malleable and easily accessible.

Engage in developing a results driven culture of assessment at Southern University.

Participate in a process that will allow for data-driven curricular improvements that foster improved student learning and performance.

B. Administrative

Each learner enrolled in this course will meet set requirements!

1) Attend class regularly and punctually. Excessive absences will be reported to the proper authorities, and excessive unexcused absences will adversely affect final grade. The learner is responsible for keeping up with all course work and submitting all work by applicable deadlines whether or not an excused absence had been granted.

2) Notify professor when you will miss an examination **before** the examination is administered, then discuss rescheduling of examination.

3) Adhere to the policy of no make-ups on quizzes.

3) Adhere to Academic Calendar: [See http://www.subr.edu]

4) Academic Dishonesty: Adhere to honesty and integrity in work submitted for credit in this course and adhere to SUBR's Code of Conduct. (Refer to current catalog.) With excessive copying (determined by the professor), learners grade/per assignment will be compromised.
http://web.subr.edu/fileadmin/files/pdf/Southern_1b__21-39_.pdf

VI. COURSE SCHEDULE

	Activity	Date(s)
1)	Class assignments	**TBA**

2) Tests **TBA** Approximately 4 - 50 minute tests

3) **Examinations: **Midterm:** TBA
Final: TBA

4) **BLACKBOARD** assignments/projects TBA by professor. Please read **BLACKBOARD** (http://blackboard.subr.edu) for announcements often.

VII. EVALUATION OF LEARNERS

The final grade will be determined by the average of the following:

Chapter (or other) Tests	100 points each
Assignments	≤ 50 points for each
Mid-term	100 - 150 points
Comprehensive Final	150 – 200* points

VIII. GRADING

89.0 – 100.0	A
79.0 -- 88.9	B
69.0 -- 78.9	C
58.0 -- 68.9	D
Below 58.0	F

IX. *If you have a documented disability, then please discuss it with personnel at 771-3950 in Room 125 of Blanks Hall. A learner that is considered as having a disability is to provide the professor with an official letter from the Department of Special Education stating the appropriate accommodations required of this course.*

DISCLAIMER: **THESE ACTIVITIES AND ASSIGNMENTS ARE TENTATIVE. CHANGES MAY OCCUR DUE TO ASSESSMENT OF LEARNERS BY THE PROFESSOR AND DUE TO THE PROFESSOR.**