# Shawnee State University
## STAT1150 Principles of Statistics
### and
## MATH0101 Basic Algebra with Geometry and Applications

## (4-credit hours)

**Instructor:** Heather Waugh, M.S.
**Prerequisite:** ACT of 15 – 17 and Chair/Instructor Permission
**Office:** 117 ADM (Administration part, Massie First Floor)
**Office Hours:** Wednesday: 11:00am-12:30pm, Thursday: 10:00am-10:50am,
Friday: 12:00pm-12:50pm, 2:00pm-3:00pm
**E-mail**: hwaugh@shawnee.edu

## Catalog Description

This course merges the content from two courses: STAT1150 and MATH0101. The statistics portion of the course introduces students to the vocabulary, concepts, and presentation of statistics, while the basic algebra portion of the class introduces students to prerequisite content that is deemed important for learning statistics. The course will implement the use of the graphing calculator as a catalyst for critical thinking.

Topics include:

- **Statistics**: exploring data, describing patterns, describing measures of central tendency and variability, sampling distributions and experimentation, planning and conducting a study, normal distributions, and statistical inference.
- **Basic Algebra**: linear expressions and equations in numeric, graphic, and symbolic form; linear models; scientific notation; and, radicals and radical equations.

## Class Format

This class implements a "just in time" remediation approach and presents material from Basic Algebra just before it's used to learn statistics.

The statistics component is offered: Tuesday and Thursday, 11:00 AM to 12:15 PM.

The basic algebra component meets: Tuesday, 10:00 AM to 10:50 AM.

# Attendance for the basic algebra component is MANDATORY! If you have more than two (2) unexcused absences, then you will FAIL the class.

## Course Objectives

Students who successfully complete this statistics portion of the course will be able to:

- distinguish between categorical and quantitative data;
- display data using histograms, bar and pie charts, boxplots, and scatterplots;
- describe data using numerical summaries;
- use basic properties of the Normal Distribution;
- calculate probabilities of raw scores from Normal Distributions;
- find and interpret the coefficients of a least squares regression line;
- find and interpret the correlation coefficient and the coefficient of determination;
- use the Central Limit Theorem to calculate probabilities;
- communicate the importance of random sampling in a statistical study;
- construct and interpret confidence intervals and margin of error for population means and population proportions;
- conduct a test of hypothesis for a population mean (when the population standard deviation is known and unknown) and for a population proportion; and,
- report and interpret statistical results.

Students who successfully complete this statistics portion of the course will be able to:

- create and use linear models;
- find the slope of a line through two points;
- create the equation of a linear model;
- solve equations that involve radicals.

## General Education Requirements

This course fulfills the Quantitative Reasoning component of the General Education Program by focusing on "real world" data and data analysis. The student should improve their ability to solve problems and think critically. Graphing calculators are used in analyzing data. Students communicate their analyses orally and in writing.

## ADA Statement

Any student who believes s/he may need an accommodation based on the impact of a documented disability should first contact a Coordinator in the Office of Disability Services, Student Success Center, Massie Hall, 740-351-3276 to schedule a meeting to identify potential reasonable accommodation(s). Students are strongly encouraged to initiate the accommodation process in the early part of the semester or as soon as the need is recognized. After meeting with the Coordinator, students are then required to meet with their instructors to discuss the student's specific needs related to their disability. If a student does not make a timely request for disability accommodations and/or fails to meet with the Coordinator of Disability Services and the instructor, a reasonable accommodation might not be able to be provided.

**Technology**

A Texas Instruments TI-83 or TI-84 is required. There are a variety of options for purchasing a calculator that will be discussed during the first class.

Students will need to download R, which is a statistical software package that will be used to analyze data. You can download R: http://www.r-project.org/. During the download process you'll need to select a CRAN (Comprehensive R Archive Network). Please select: http://cran.stat.ucla.edu/, which is located under "USA."

**Textbook and Online Course Management System**

**Textbook (Optional):** Beginning Statistics by Warren, C., Denley, K., and Atchley, E., Second Edition.

**Online Companion:** HAWKES LEARNING http://www.learn.hawkeslearning.com/. To sign up in HAWKES LEARNING, you will need an access code which comes bundled when you purchase a new textbook from SSU's bookstore. If you feel that you don't need a textbook, then you can buy just the access code on the site http://www.learn.hawkeslearning.com/. In fact, you will have an access to an electronic version of the textbook after you buy the access code.

Chapters (sections) that will be covered:

- Chapter 1, Introduction to Statistics (1.1 – 1.4)
- Chapter 2, Summarizing and Graphing (2.1 – 2.4)
- Chapter 3, Statistics for Describing, Exploring, and Comparing Data (3.1 – 3.4)
- Chapter 4, Probability  (4.1 – 4.2)
- Chapter 6, Normal Probability Distributions (6.1 – 6.5)
- Chapter 7, The Central Limit Theorem (7.1 – 7.3)
- Chapter 8, Confidence Intervals (8.1 – 8.4)
- Chapter 10, Hypothesis Testing (10.1 – 10.3)

- Chapter 12, Regression (12.1-12.2)

## Tutors
Please visit the Math Lab (ADM 150) for drop-in tutoring.

## Class Policies and Grading

• Cell phones and computers are **<u>NOT</u>** permitted during class!

• If you miss an examination, documentation will be required for a make-up.

• There will be labs throughout the semester, one every week either on Mondays or Fridays depending on your section. These labs will be supplemented with the software package, R. You are expected complete solutions to these lab problems. However, some lab days may be used for lecture if needed. You are **<u>Required</u>** to attend lab each week.

• You will have an assignment posted each week (approximately) online. All assignments are due on Sundays at 11:50 PM. Assignments will be posted on Mondays by 8:00am. You are expected to submit the assignments by the due date and time. There is a 50% penalty will be assessed to assignments that aren't submitted by the due date.

• Quizzes will be online in Hawkes. You will have one week to finish the quiz and if you fail to complete the quiz by the due date and time, there will be no makeup.

• I recommend that you print the power point slides before class to follow along. The lecture notes will be posted under the materials tab for each chapter in Hawkes.

Come to class and lab regularly. This is so important! This course is not difficult, but you need to attend consistently to do well.

### Calculating Your Final Grade

| | |
|---|---|
| **Midterm** | **30%** |
| **Final (Comprehensive)** | **30%** |
| **Homework/Labs** | **30%** |
| **Attendance** | **5%** |
| **Quizzes** | **5%** |

**Note:** If you have "very good attendance" and score higher on the Final than the Midterm, then I will replace your score on Midterm with your score on the Final.

**Grade Breakdown:**

A: 90-100%     B: 80-89%     C: 70-79%

D: 60-69%    F: 0-59%

**Tentative Schedule**

| Week | Topics, Basic Algebra | Topics, Statistics |
|------|----------------------|--------------------|
| 1 | Review and Preview, 1-1 | Class Policies; Introduction to Statistics |
| 2 | Review and Preview, 2-1 | Summarizing with Graphs |
| 3 | Review and Preview, 3-1 (a) | Describing and Comparing Data |
| 4 | Review and Preview, 3-1 (b) | Describing and Comparing Data |
| 5 | Review and Preview, 4-1 | Probability and Normal Distributions |
| 6 | Review and Preview, 6-1 (a) | Normal Distributions |
| 7 | Review and Preview, 6-1 (b) | Normal Distributions |
| 8 | Study Session for Midterm Examination | - Midterm Examination - |
| 9 | Review and Preview, 6-1 (c) | Central Limit Theorem |
| 10 | Review and Preview, 7-1 (a) | Estimates |
| 11 | Review and Preview, 7-1 (b) | Estimates |
| 12 | Review and Preview, 8-1 (a) | Hypothesis Testing |
| 13 | Review and Preview, 8-1 (b) | Hypothesis Testing |
| 14 | Review and Preview, 10-1 (a) | Correlation and Regression |
| 15 | Review and Preview, 10-1 (b) | Correlation and Regression |
| 16 | No Class | - Final Examination - |

**Important Dates**

The class syllabus should include a list of important dates, including the last day to drop, holidays and dates when the university is closed, and the final exam schedule.