



**OFFICE LOCATION:** P&HCC West Hall, 2<sup>nd</sup> Floor, Room 202

**OFFICE HOURS:** M-F 12:30 – 3:00 P.M., or by appointment

**OFFICE PHONE:** 276 – 656 – 0328, extension 4

**E-MAIL ADDRESS:** [sharrell@pgsmst.com](mailto:sharrell@pgsmst.com)

**CLASS MEETING TIME:** M/W 7:45 – 9:15 a.m.

**CLASSROOM LOCATION:** P&HCC West Hall, 1<sup>st</sup> Floor, Room 124

**COURSE CREDITS:** 3

**PREREQUISITE(S):** Completion of MTH 245 Statistics I or equivalent with a grade of “C” or better accepted.

#### **COURSE DESCRIPTION**

This course is a dual enrollment college level course that continues the study of estimation and hypothesis testing with emphasis on advanced regression topics, experimental design, analysis of variance, chi-square tests, and non-parametric methods. Applications of real-life data are used with Microsoft Excel, Minitab, and TI 84 Plus software.

#### **COURSE INTRODUCTION**

Because today’s advances in technology make information and data readily available, effective analysis and interpretation are crucial. Critical thinking and interpretation are essential in understanding and evaluating information. The field of statistics meets these needs by preparing students to make informed and purposeful decisions. The concepts in this course will strengthen students’ understanding of how statistics—as well as the underlying research and data—impact their perspectives and their everyday lives.

#### **A. COURSE OBJECTIVES**

Upon successful completion of this course, the student should:

- Develop effective study skills in order to master course content and objectives.
- Demonstrate an understanding of the basic mathematical skills used in statistics.
- Communicate clearly and effectively the principles of statistics using proper vocabulary.
- Apply the statistical concepts to solve applied problems in statistics, as well as in other disciplines.
- Use statistics in a technological environment.
- Develop effective study skills in order to master course content and objectives.

#### **Content Covered**

##### **I. Review of Hypothesis Testing**

- a. Conduct hypothesis tests for population means and proportions.
- b. Conduct a hypothesis test for the quality of two populations where:
  - i. The samples are independent and the population variances are assumed unequal.
  - ii. The data consists of matched pairs.
- c. Conduct a hypothesis test for the presence of correlation.

## **II. Experimental Design**

- a. Define and apply the basic principles of design, including randomization, replication, and treatment/control groups.
- b. Explain single and double blinding.
- c. Describe the placebo and experimenter effects and describe how they can be countered using blinding.
- d. Design experiments using the following methods:
  - i. Completely randomized
  - ii. Randomized block
  - iii. Matched pairs
- e. Explain the concept of confounding.

## **III. Correlation and Regression**

- a. Construct and interpret the residual plot related to a simple least-squares regression model.
- b. Conduct hypothesis tests related to the coefficients of a simple least-squares regression model.
- c. Construct and apply a logistic regression model.
- d. Calculate the coefficient of determination, the adjusted coefficient of determination, and overall p-value for a multiple regression model and use them to construct a best-fit multiple regression equation.

## **IV. Categorical Data Analysis**

- a. Conduct chi-squared tests for
  - i. Goodness of fit
  - ii. Independence between rows and columns of a two-way contingency table
  - iii. Homogeneity of population proportions.

## **V. Analysis of Variance**

- a. Conduct one-way ANOVA to test the equality of two or more population means for both equal and unequal sample sizes and recognize its relationship to the pooled two sample t-test.
- b. Conduct a multiple comparison test, such as Tukey's HSD to determine which of the three or more population means differs from the others.
- c. Conduct a two-way ANOVA on sample data categorized with two fixed factors.

## **VI. Nonparametric Methods**

- a. Determine the rank of each element of a sorted data set.
- b. Identify the relationship between a nonparametric test and its corresponding parametric technique
- c. Conduct a Wilcoxon signed-ranks test for a single sample
- d. Conduct a Wilcoxon signed-ranks test for matched pairs.

## **VII. Technology Application**

- a. Construct statistical tables, charts, and graphs using appropriate technology.
- b. Perform statistical calculations using an appropriate statistical software package.
- c. Complete statistical project.

## B. VCCS CORE COMPETENCIES

Degree graduates will demonstrate the ability to

- 1.1 Understand and interpret complex materials;
- 2.6 Use problem solving skills;
- 4.1 Determine the nature and extent of the information needed;
- 4.2 Access needed information effectively and efficiently;
- 6.1 Use logical and mathematical reasoning within the context of various disciplines;
- 6.2 Interpret and use mathematical formulas;
- 6.3 Interpret mathematical models such as graphs, tables and schematics and draw inferences from them;
- 6.4 Use graphical, symbolic, and numerical methods to analyze, organize, and interpret data;
- 6.5 Estimate and consider answers to mathematical problems in order to determine reasonableness; and
- 6.6 Represent mathematical information numerically, symbolically, and visually, using graphs and charts.

## C. METHOD OF INSTRUCTION

A variety of instructional methods will be utilized throughout this course. Students will be introduced to the mathematical concepts in the classroom via lecture, cooperative learning, and exploration. As a group we will work extensively on study habits, appropriate use of the graphing calculators, and student communication – both oral and written. Students will be encouraged to actively participate in the learning process to help ensure that they understand the material. Many examples will be provided through lecture and class activities. The use of e-mail and Canvas is essential.

## D. TEXTBOOK(S) AND REQUIRED TOOLS OR SUPPLIES

*Understandable Statistics: Concepts and Methods* Eleventh Edition

Charles Henry Brase, Corrinne Pellillo Brase

Cengage Learning Inc., 2015

- Pencils
- Loose-leaf notebook paper (lots!)
- Colored Pencils
- Bring 3 ring binder from Statistical Reasoning
- TI-84 Graphing Calculator

## E. STUDENT EVALUATION

Grades will be calculated using the points system (i.e.  $\frac{\text{points earned}}{\text{points possible}} \times 100$ ). Each assignments point value

will be determined by the level of difficulty. Students will be assessed in various ways, including, but not limited to, homework assignments, activities, assessments, and projects.

- **Homework:**
  - For each lesson, students will be provided a note sheet and practice problems to complete for homework.
  - Students will discuss homework daily with a study partner. This will be followed by a class discussion led by the instructor.
  - Homework should be kept in a three-ring binder and should be organized chronologically. The student's name should be on the top right corner of every page.

- There are no points associated with completing homework, but feedback will be provided to ensure that students understand the content. **Completing practice problems is essential to learning and understanding the content for this course.**

- **Assessments:**

- One or two closed-book quizzes will be given in each unit, usually covering two or three sections of the chapter. These quizzes will be announced and will be a combination of multiple choice and free-response questions.
- Quizzes will be completed in class and will be taken individually without the use of notes or other resources.
- **Quizzes will be worth 50 points.**
- A test will be given at the end of each unit. Tests are a combination of multiple choice and free-response questions.
- Tests will be completed in class and will be taken individually without the use of notes or other resources.
- **Tests will be worth 100 points.**

- **Projects:**

- Students will be assigned projects throughout the semester to assess students' mastery of course content.
- Depending on the level of difficulty, projects will be worth 50 points or 100 points as specified on the grading rubric provided with the project guidelines.
- Projects not submitted by the due date will incur a 20% deduction per day after the due date.

- **Exam:**

- An exam will be given at the end of the semester and will count 20% of the semester grade.

**There are a few policies regarding final exams found in the Governor's School student handbook:  
Semester Exam Policy**

All students are expected to take semester exams on the day scheduled. Only in a rare case, such as illness confirmed by a physician, death in the family, or a required base school activity confirmed by a student's principal will a make-up be allowed. **All exceptions to the examination schedule must be approved ahead of time by the Director.** If a student does not report for a semester examination due to an emergency, the Governor's School office must be notified on the day of the exam by the student's parent/guardian. Failure to follow this policy may result in a grade of zero (0) for the exam.

**F. GRADING SCALE:**

- A 90 - 100
- B 80 - 89
- C 70 - 79
- D 60 - 69
- F 59 - below

**Final grade for the course is calculated as follows:  
Grading Quarter 1: 40%  
Grading Quarter 2: 40%  
Final Exam: 20%**

*A student earning a grade of C or higher will earn college credit for this course.*



## G. EXPECTATIONS FOR STUDENT SUCCESS



### Attendance

- **Students should email the instructor when missing a class to obtain the notesheet and/or any missed assignment(s).**
- Students should see the instructor the day he/she returns from a missed class to ask questions pertaining to the lecture and/or assignment.
- Students should make arrangements to make up any assessment that is missed due to absence.
- **Students should submit a note to Mrs. East within 24 hours** of the student's return with a valid reason for student's absence. **No make-up work will be allowed for unexcused absences and any assignment for that day will receive a zero.**

### Submitting Work

- All assignments should be saved as **"last name\_first initial\_assignment name"**.
- Students should submit all work by the due date. **If absent for any reason, the assignment should be scanned in as a pdf and emailed to the instructor.**
- All assignments that must be submitted electronically, i.e. projects or activities, should be turned in **as one document**, Microsoft Word or PDF. **The document can contain multiple pages if necessary, however, it should not be multiple attachments. If multiple attachments are submitted, then only the content in the first attachment will be graded.**

### Check Grades

- Although all course content is delivered and posted using Canvas, grades will be entered in **ThinkWave**. Please make sure to check these every day. If there is a problem, see me immediately. DO NOT wait until the end of the grading quarter to discuss a problem.
- If you are caught cheating, the grade for that assignment will be a zero.

### Class Atmosphere

- **Students should show respect for classmates and the instructor, listen carefully, and not interrupt someone who is talking.**
- **Cell phones and personal electronic devices, including smartwatches, headphones, and any device that connects to phones, are not allowed during the bell-to-bell school day. Devices must be turned off and stored in a backpack or purse, not on the student. Disciplinary action will be taken against any student found in possession of a cell phone or personal electronic device, including smartwatches, headphones, and any device that connects to phones during restricted times or in violation of school policies.**
- **Students should abide by all rules as outlined in the student handbook.**
- **Students may have food and drinks in the classroom; however, students must leave their area clean.**
- **Students should respond to any emails that you receive from the instructor (individual or group emails should be answered).**

### WHAT A STUDENT CAN EXPECT FROM THE INSTRUCTOR

- Continuous support, assistance, and encouragement.

- **Access to all lessons**. Lessons will be recorded, uploaded to YouTube, and the link will be posted on a Google Doc. Access to the Google Doc is available on Canvas.
  - **One-on-one tutoring**. The instructor will be available between classes and after governor’s school for tutoring. Tutoring is available at other times by appointment. Please email if you would like to set up a time to meet to work on specific questions or topics/concepts.
  - **Timely responses to emails**. Students should **email the instructor using their pgsmst email accounts and emails should be sent to [sharrell@pgsmst.com](mailto:sharrell@pgsmst.com)**. I check my email frequently each day, Monday – Friday, to answer any questions about homework, assignment clarification, etc., and I will answer within 24 hours. I check my email sporadically on Saturday and Sunday and will respond within 48 hours.
- Feedback
    - The instructor will evaluate routine assignments within 72 hours. For more involved projects or assignments, expectations will be communicated with students regarding grading and feedback.

#### **H. EMERGENCY INFORMATION**

In case of emergency students should exit the classroom, turn left, and then turn left to exit the building through the automatic doors. Students should proceed quickly and quietly to the far end of the parking lot adjacent to Stone Hall.

#### **I. STUDENT SUPPORT/DISABILITY STATEMENT:**

Patrick & Henry Community College makes every effort to accommodate individuals with disabilities for all programs, services, and activities available to the public.

#### **J. IMPORTANT DATES TO REMEMBER:**

The **school calendar** is available in the student handbook and at the following link: [www.pgsmst.com](http://www.pgsmst.com).

**\*\*\* PGSMST does not follow the Henry County nor Martinsville calendars, so be sure to check the governor’s school calendar. Henry County/Martinsville work days do not impact classes at Piedmont Governor’s School.\*\*\***

#### **K. SPECIFIC COLLEGE POLICIES**

##### **Academic Honesty**

Students are expected to abide by the code of conduct and academic integrity found in the student handbook. Students will be required to sign a pledge on any take-home quizzes/tests stating *“On my honor, I have neither given nor received aid on this assignment.”* Infractions of the honor code will not be tolerated and will be reported to the director and will be addressed with the student and his/her parent(s)/guardian(s). All violations of academic integrity will also be reported to each student’s honor organization.

##### **Inclement Weather**

- If Henry County Schools are delayed one hour, Governor’s School will open one hour late.
- If Henry County Schools are delayed two hours, Governor’s School classes will be canceled.
- If Henry County Schools are closed, Governor’s School is closed, and classes do not meet.

- If Patrick Henry Community College is closed, Governor’s School will be closed.
- One common question asked is “If my base school is closed but roads in my residential area are clear, should I come to Governor’s School?” The decision to attend under those circumstances should be made by the parent(s)/guardian(s).

Assignments and/or lectures may be posted on Canvas on days when Governor’s School classes are affected by inclement weather. It is the student’s responsibility to check Canvas and complete the assignments before their next class meeting.

## L. RESOURCES

- **BRAIN FUSE** is an online tutoring service and is embedded into Canvas. Click on the course and select “Brainfuse tutoring” from the main screen, left sidebar, to have access to a live tutor.



Brainfuse is an online tutoring service which gives students 24/7 access to highly qualified, experienced, and specially trained tutors. Virtual whiteboard technology lets students and tutors share the same screen. Students may submit writing assignments to be evaluated / proofread. All live sessions with tutors and submitted questions are saved so students can view or print them out. Any PHCC student can access Brainfuse **free** of charge. Brainfuse can only be accessed through Canvas. Further information may be obtained from your instructor or the Writing Center Tutors.

- **Testing Center**

The P&HCC testing center is located in the LRC.

### Testing Center Normal Hours

Monday - Wednesday: 8am - 5pm [*students will not be admitted after 4pm*]

Thursday: 8am - 7pm [*students will not be admitted after 6pm*]

Friday: 8am - 5pm [*students will not be admitted after 4pm*]

Saturday: 9am - 1pm [*students will not be admitted after 12 Noon*]

Please be advised: *Testing Center staff reserve the right to close the center one hour before the posted closing time if no students are present.*

**Due to staffing limitations, Testing Center hours may change on short notice.** Students may call the testing center at **276-656-0358** to verify the current operating hours before arriving for an exam.

- **P&HCC Math Lab**

The P&HCC Math Lab is located in the LRC. Hours for this lab change each semester and are posted in the lab and on the P&HCC website (academics>math resources). Experienced math tutors are always available in the math lab to assist students with their math. In addition, the math lab has computers available for student use. The P&HCC tutoring coordinator can be reached at 276-656-5496 to schedule free, individual tutoring.

- Some other **resources** for tutoring are as follows:
  - Canvas – Teacher instructional videos on Google Doc
  - Youtube
  - Khan Academy
  - Teacher Tube



Patrick & Henry Community College

MTH 246 G1 Statistics II

Spring 2025

INSTRUCTOR: Shannon Harrell

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**M. AFFIDAVIT**

My signature below indicates that I have read and understand this syllabus.

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Student Name \_\_\_\_\_ Parent/Guardian Name \_\_\_\_\_

Student Signature \_\_\_\_\_ Parent/Guardian Signature \_\_\_\_\_

Date \_\_\_\_\_ Date \_\_\_\_\_

**Note: *This syllabus is subject to change at the discretion of the instructor. It is the responsibility of the student to keep abreast of these changes.***

**This syllabus conforms to the Patrick & Henry Community College syllabus guidelines.**