Patrick & Henry Community College

MTH 155-G1 **Statistical Reasoning** Fall 2025
Tues/Thurs 7:45 to 9:15
INSTRUCTOR: Jenny J. Whittaker

OFFICE LOCATION: PHCC West Hall, room 202

STUDENT ENGAGEMENT HOURS: M-F 11:00 AM – 2:30 PM, or by appointment

OFFICE PHONE: 276-656-0328, ext. 3

E-MAIL ADDRESS: jwhittaker@patrickhenry.edu
jwhittaker@pgsmst.com

CLASS MEETING TIME: T/Th 7:45 AM to 9:15 AM

CLASSROOM LOCATION: PHCC West Hall, room 224

MODE OF DELIVERY: face to face

COURSE CREDITS: 3

PREREQUISITE(S): Competency in Math Essentials MTE 1-5 as demonstrated through the placement and diagnostic tests, or by satisfactorily completing the required MTE units or equivalent.

COURSE DESCRIPTION
This course presents elementary statistical methods and concepts including descriptive statistics including data presentation, descriptive statistics, probability, estimation, hypothesis testing, correlation, linear regression, and categorical data analysis. Emphasis is placed on the development of statistical thinking, simulation, and the use of statistical software.

COURSE INTRODUCTION
Statistical Reasoning is a first course in statistics for students whose college and career paths require knowledge of the fundamentals of the collection, analysis, and interpretation of data. Emphasis is placed on the development of statistical thinking, simulation, and the use of statistical software. Students should develop an appreciation of the need for data to make good decisions and an understanding of the dangers inherent in basing decisions on anecdotal evidence rather than data. To that end, students will use appropriate data-collection methods and statistical techniques to support reasonable conclusions through the following content learning outcomes: Data Exploration, Statistical Design, Probability and Simulation, and Statistical Inference.

A. COURSE OBJECTIVES

- Graphical and Numerical Data Analysis
  - Identify the difference between quantitative and qualitative data
  - Identify the difference between discrete and continuous quantitative data
  - Construct and interpret graphical displays of data, including (but not limited to) box plots, line charts, histograms, and bar charts
  - Construct and interpret frequency tables
  - Compute measures of center (mean, median, mode), measures of variation, (range, interquartile range, standard deviation), and measures of position (percentiles, quartiles, standard scores)
- Sampling and Experimental Design
  - Recognize a representative sample and describe its importance
  - Identify methods of sampling
  - Explain the differences between observational studies and experiments
  - Recognize and explain the key concepts in experiments, including the selection of treatment and control groups, the placebo effect, and blinding
- Probability Concepts
  - Describe the difference between relative frequency and theoretical probabilities and use each method to calculate probabilities of events
  - Calculate probabilities of composite events using the complement rule, the addition rule, and the multiplication rule.
  - Use the normal distribution to calculate probabilities
  - Identify when the use of the normal distribution is appropriate.
  - Recognize or restate the Central Limit Theorem and use it as appropriate.
- Statistical Inference
  - Explain the difference between point and interval estimates.
  - Construct and interpret confidence intervals for population means and proportions.
  - Interpret the confidence level associated with an interval estimate.
  - Conduct hypothesis tests for population means and proportions.
  - Interpret the meaning of both rejecting and failing to reject the null hypothesis.
  - Use a p-value to reach a conclusion in a hypothesis test.
  - Identify the difference between practical significance and statistical significance.
- Correlation and Regression
  - Analyze scatterplots for patterns, linearity, and influential points
  - Determine the equation of a least-squares regression line and interpret its slope and intercept.
  - Calculate and interpret the correlation coefficient and the coefficient of determination.
- Categorical Data Analysis
  - Conduct a chi-squared test for independence between rows and columns of a two-way contingency table.
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B. GENERAL EDUCATION OBJECTIVES

- Communication
  - Interpret and communicate quantitative information and mathematical and statistical concepts using language appropriate to the context and intended audience.
    - Use appropriate statistical language in oral, written, and graphical terms.
    - Read and interpret graphs and descriptive statistics.
- Problem Solving
  - Make sense of problems, develop strategies to find solutions, and persevere in solving them.
  - Understand what statistical question is being addressed, use appropriate strategies to answer the question of interest, and state conclusions using appropriate statistical language.
- Reasoning
  - Reason, model, and draw conclusions or make decisions with quantitative information.
    - Use probability, graphical, and numerical summaries of data, confidence intervals, and hypothesis testing methods to make decisions.
    - Support conclusions by providing appropriate statistical justifications.
- Evaluation
  - Critique and evaluate quantitative arguments that utilize mathematical, statistical, and quantitative information.
    - Identify errors such as inappropriate sampling methods, sources of bias, and potentially confounding variables, in both observational and experimental studies.
    - Identify mathematical or statistical errors, inconsistencies, or missing information in arguments.
- Technology
  - Use appropriate technology in a given context.
    - Use some form of spreadsheet application to organize information and make repeated calculations using simple formulas and statistical functions.
    - Use technology to calculate descriptive statistics and test hypotheses.

C. TEXTBOOK(S) AND REQUIRED TOOLS OR SUPPLIES

No Textbook

Supplies

- Pencils
- One 1-2” 3-ring binder to include Notes/Homework, Quizzes/Tests, Projects/Labs
- Loose-leaf paper
- TI-84 Graphing calculator (may be checked out from the school)
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D. STUDENT EVALUATION

Grades will be calculated using the points system (i.e. $\frac{points\ earned}{points\ possible}$ x 100). Each assignment will be worth a certain point value depending on the level of difficulty. Students will be assessed in various ways, including, but not limited to, homework assignments, activities, assessments, and projects.

9 weeks grading periods are calculated by the following. Each grading period grade is 40% of your final grade.

- **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 students.
  - Homework should be kept in a three-ring binder and should be organized chronologically by lesson number of the assignment included at the top of the page.

- **Quizzes – 50 points**
  - There will be 2-3 quizzes on the material you have learned for each unit. These quizzes are cumulative.
  - Quizzes will be completed in class and will be taken individually with the use of notes.

- **Tests – 100 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.
  - If your test grade is higher than your quiz average, your quiz grade will be adjusted to match your test score.

- **Projects – 50 or 100 points**
  - 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.

- **Final Exam - 100 points**
  - Individual Project (100 points) – Student will select their own question and parameter of interest, collect data, present descriptive statistics, and support their findings with

inferential statistics. Student will submit a typed report of their findings. A rubric will be provided for expectations. ***This project will not be accepted late.***

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.

E. GRADING SCALE:

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

Grades are calculated as follows
Quarter 1 – 40%
Quarter 2 – 40%
Final Exam – 20%

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

F. EXPECTATIONS FOR STUDENT SUCCESS

- Be present for each class
  - Students should email the instructor when missing a class. All lessons will be recorded and uploaded into the Canvas Module for that date. Make sure to watch the videos and complete the accompanying assignments by the due date.
  - 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.
  - Students should see instructor the day returning from a missed class to ask questions pertaining to the lecture and/or assignment.
  - Students should make arrangements to make up quizzes/tests if missed due to absence.

- Submit all work on time.
  - Students should submit all work by the due date. Assignments not submitted by the due date will incur a 20% deduction per day after the due date.
  - Work that is to be submitted on Canvas should be uploaded in the Assignment Tab for the specified assignment. Work should be scanned and uploaded as one document. To submit assignments on Canvas, click on the link for the assignment, then upload the file, preview the file to ensure that all portions or problems are present, then click the "submit" icon. Log out, log back in, and make sure to double check that your submission went through. "Canvas must not be working" is not an excuse for late work.

- Check grades often
  - Although all lessons are available and all work is submitted through 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 9 weeks to discuss a problem.
  - If you are caught cheating, that grade will be recorded as a zero.

- Create a fun learning environment.
  - Students may have drinks in the classroom, provided the drink has a screw-on cap. Students must leave their area clean.
  - Students should show respect for classmates and instructor, listen carefully, and not interrupt someone who is talking.
  - Cell phones and apple watches may not be used in class unless permission is given by the instructor. All other devices must remained closed unless needed for an assignment. Phones and apples watches must be placed in silent mode and placed in your personal designated area upon entering the classroom.

WHAT A STUDENT CAN EXPECT FROM THE INSTRUCTOR

- On any day that a student is absent from class, the student will be able to access the recorded lesson and proceed as if he/she were in class.
- Homework posted on Canvas upon a student's absence from class will be assessed, and feedback provided within 48 hours.
- The instructor will evaluate and return quizzes and tests work promptly with feedback.
- The instructor will be available before school by 7:15 A.M., between classes, and after governor's school for tutoring.
- Continuous support, assistance, and encouragement.
- Timely responses to emails. Students should email the instructor using their pgsmst email accounts and emails should be sent to jwhittaker@pgsmst.com. I check my email frequently each day to answer any questions about homework, assignment clarification and will answer quickly. If outside of school hours, responses may be delayed, but I do still try to respond quickly.

G. STUDENT SUPPORT/DISABILITY STATEMENT:

Patrick & Henry Community College is committed to providing equal educational opportunities and appropriate academic accommodations to students with disabilities, in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA). If you have a disability or believe you may require reasonable accommodations to successfully complete this course, please contact the Accessibility Specialist, located in the Walker Fine Arts Building, Room 235, at 276-656-0257 or accessibility@patrickhenry.edu, to discuss your needs confidentially. Early contact is encouraged to ensure timely access to accommodations and services.

H. EMERGENCY INFORMATION

See below for pertinent safety information.

https://www.patrickhenry.edu/campus-safety/alert-systems/

J. IMPORTANT DATES TO REMEMBER:
The school calendar is available at the following link: www.pgsmst.com .

K. SPECIFIC COLLEGE POLICIES
Academic Integrity

Academic integrity is a fundamental value of the P&HCC community. All students are expected to exhibit conduct keeping with the values of honesty, trust, fairness, respect, and responsibility. Behavior that violates this fundamental value will be handled in accordance with the college's Academic Integrity Policy
The link to the Academic Integrity Policy is
https://www.patrickhenry.edu/wp-content/uploads/2025/01/Academic-Integrity-Policy-REV1.7.2025.pdf
Other policies associated with student conduct may be found here:
https://catalog.patrickhenry.edu/content.php?catoid=10&navoid=625
No Generative AI Usage Permitted: For the duration of this course, the use of Generative AI in assignments is strictly prohibited. Assignments are opportunities for personal growth, critical thinking, and applying your acquired knowledge. Your individual effort and creativity are essential in demonstrating your understanding of the course material. Dependence on AI undermines these objectives and compromises the integrity of the learning process. We appreciate your commitment to academic honesty and dedication to upholding this course's principles by refraining from using Generative AI in your assignments.

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 cancelled. If Henry County schools are closed, Governor's School is closed, and classes do not meet. Henry County/Martinsville workdays do not impact classes at Piedmont Governor's School.

- 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.
- A link will be established on Canvas where students should submit homework that is due on a day where governor's school is cancelled. Homework should be posted by 7:00 AM of the day the assignment is due.

Testing Center and Learning Lab
The Testing Center and Learning Lab are located on the first floor of the Learning Resource Center (LRC) on the main campus. Students enrolled in face-to-face classes may be required to make up missed tests in the Testing Center. Online classes require the use of Respondus Lockdown or Respondus Monitor or similar proctoring programs. In some cases, students outside the service region may be required to take proctored tests at a different site. If this is the case, students must complete the Student-Proctor Agreement form (see form for proctor requirements/guidelines).
https://www.patrickhenry.edu/wp-content/uploads/2024/03/StudentProctor.pdf

Tutoring and Academic Support

Free individual and group tutoring is available both in-person and online at P&HCC. Students can access Brainfuse, our primary platform for academic support, through Canvas or their MyP&HCC portal. Live help from a Brainfuse tutor is available 24/7. To connect with a P&HCC tutor, use the Tutor Match feature within Brainfuse to view subjects and schedule a session with our on-site staff.
For more information, visit: www.patrickhenry.edu/tutoring. If students need further assistance, they may contact Tutoring Coordinator, Greg Morrison, at gmorrison@patrickhenry.edu, or Coordinator of Academic Services, Valandrea Dillard, at vdillard@patrickhenry.edu.

brainfuse
ignite your mind

L. STUDENT LEARNING OUTCOMES

Students may note in Canvas that student learning outcomes have been reported for the course (this does not apply to all courses). If the outcomes constitute a graded assessment or are part of a larger graded assessment, those outcomes are part of your course grade (see section D on "Student Evaluation"). Otherwise, the outcomes do not impact your course grade. Ask the instructor if you have questions regarding student learning outcomes.

M. OTHER POLICIES

All P&HCC policies are applicable to this class whether explicitly indicated in this syllabus or not.

N. QUIZ/AFFIDAVIT

To confirm each student has read and understands the syllabus and has been provided access to the syllabus, he/she must complete the syllabus affidavit. The syllabus affidavit is available on Canvas and must be completed by August 25.

M. AFFIDAVIT

My signature below indicates that I have read and understand this syllabus and have been given a copy of my own to keep.

Student Name (Print)

Student Signature

Date

Parent Name (Print)

Parent Signature

Date

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