



## Math 1150 Introduction to Statistics

**Required:** Access to MyStatLab which includes the eText. Help with registering: [MyStatLab Help](#)

**Optional:** Printed copy of the textbook: **Essential STATISTICS** by Robert Gould, Colleen Ryan and Rebecca Wong; 3rd edition. A copy of the textbook is on reserve for library use only at the front of Jerome Library. **If you prefer to purchase the printed copy of the book, you have to buy the book with the access code included. Some books on the market do not include the access code.**

**Calculator:** You will need a scientific calculator.

**Prerequisites:** Two years high school algebra, one year of geometry and a satisfactory placement exam score.

**General Description:** The main objective of MATH 1150 is to give the non-mathematical student an elementary introduction to the practice of statistics. This course will give insight into how a statistician gathers, summarizes, and draws conclusions from data. We are surrounded everyday by numerical information and graphical material. At the end of the course, the student should be a critical consumer of this information.

**Reading Quiz and Homework:** Reading Quizzes and Ch X HW are found in MyStatLab. Book Homework will consist of assigned exercises from the text that will be submitted online. The more homework you can type (instead of handwriting and taking a picture) the easier it is for me to grade. **Your lowest 2 assignments among the reading quizzes and homework will be dropped.** All due dates and times are subject to change in accordance to the progress of the course. **Note that reading quizzes and homework must be turned in/submitted by the due time unless evidence of a legitimate, unavoidable problem is presented.**

**Activity:** There will be activities over the concepts covered throughout the semester. **One of the lowest activity scores will be dropped.**

**Other Assignments:** Quizzes, projects, or in-class work will be assigned throughout the semester.

**Exam:** Three exams, Exam 1, 2, and 3, would be given throughout the semester.

Note that all exams/quizzes **must** be taken at the scheduled time unless evidence of a legitimate, unavoidable problem is presented. **Make-up exams/quizzes will not be given.**

**Late Assignments:** Late assignments will not be accepted. All assignments should be turned in on time.

The overall grade will be assigned based on the performance on Reading Quiz and Homework (25%), Activity (5%), Other Assignments (10%), Exam 1 (20%), Exam 2 (20%), Exam 3 (20%).

## Grading Scale:

- A 90% - 100%
- B 80% - 89.99%
- C 70% - 79.99%
- D 60% - 69.99%
- F 0% - 59.99%



**Teaching Methods:** The instructor will integrate teaching strategies including, but not limited to: lecture, large and small group discussion, cooperative learning, case studies, internet and video. Throughout this course, students will be expected to work independently and in groups to learn about statistics.

**Cell Phones:** Cell phones need to be silenced during class time. Ringing, vibrating, blinking, dancing, singing etc. is distracting to both the instructor and the other students. **Students are not allowed to send or receive texts or calls that do not pertain to the class.** If students are expecting a call that you must take, notify me before the session starts, set your phone to vibrate, and leave the room to take the call. I reserve the right to confiscate technological devices that are not being used for classroom activities. Students will receive them back at the end of the session.

## Expectations for Behavior:

- **Course Attendance and Participation:**

The Department of Mathematics and Statistics has found that class ATTENDANCE and PARTICIPATION are important elements of student success. While a few students might find it possible to succeed without regular attendance, most students will find that regular attendance is necessary for success in this course. This does not mean that attendance by itself will generate success in this course - you must also learn the content of the course. All students should (1) make regular course attendance a priority, (2) devote significant time to studying for this course, and (3) complete all course assignments on time. You are expected to attend class regularly and actively participate in this course.



- **Students are expected to display tolerance and respect in all communication.** Communicate with others the same way you would in a traditional classroom. Comments and language should be respectful and appropriate for a college community. All comments should also follow acceptable grammar and spelling.
- **For this class to be effective, students must be an active participants.** You are expected to contribute to each class session. This includes asking questions, answering others questions, and adding relevant information. The more spontaneous you can be with your contributions, the better. I will periodically call on people to find out what they are thinking and to bring them into the conversation.
- **Treat each other with respect and dignity.** There are things that we can all learn from each other. This means allowing everyone to share their ideas and carefully considering their input. No one should ever be put down for his/her contributions.

**Stop attending the Course:** If you stop attending and participating in the course but do not officially drop or withdraw from the course, you will be assigned a grade of ATN at the end of the semester. If you do not take the final exam, you will be assigned a grade of ATN, per official University policy. The grade of ATN will appear as an F on your transcripts and will be calculated into your GPA.

To be successful in Math 1150, students should be comfortable using a computer for the following functions:

- Using a word processor (changing font, spell check)
- [Using Inbox in Canvas](#)
- Downloading files and appropriate plugins
- Taking pictures of your handwritten math work for uploading
- Converting material to PDF documents
- [Uploading documents to an assignment in Canvas](#)

**Codes of Conduct and Academic Honesty Policy:** The instructor and students in this course will adhere to the University's general Codes of Conduct defined in the BGSU Student Handbook. The Code of Academic Conduct ([Academic Honesty Policy](#)) requires that students do not engage in academic dishonesty.

**Department Mediator:** Dr. Kit Chan, 415 MSC, (419)-372-7468, [kchan@bgsu.edu](mailto:kchan@bgsu.edu)

If a student has a problem with this course, the student should first discuss the problem with the instructor. If the problem persists or is unresolved, the student should then contact the course coordinator ([xiaofz@bgsu.edu](mailto:xiaofz@bgsu.edu), Xiaofen Zhang). If the problem is still unresolved, the student should finally contact the department mediator.

**Dropping the Course:** During the first 14 calendar days of the semester, students may drop this course with no record on their transcript. After the second week, students must follow the formal withdraw policy. It is the student's responsibility to obtain the Add/Drop form and submit it to the appropriate University office.

## **BGSU**. [Learning Commons](#)

**Additional Resources:** Tutoring at the [Learning Commons](#) is a free service for all BGSU students enrolled in any course at BGSU. The Learning Commons is located on the first floor of Jerome Library. In addition to tutoring, the center also offers resources such as textbooks, computers, calculators, a variety of handouts, and a lending library. For this semester's hours of operation, please visit their [website](#).

**Technology Support Center (TSC):** Provides a central point of contact for faculty, staff and students for questions, problem reports, service requests and inquiries for University computer systems and communications technologies at BGSU. Phone: (419) 372-0999.

**Office of Accessibility Services:** In accordance with the University policy, if the student has a documented disability and requires accommodations to obtain equal access in this course, he or she should contact the instructor at the beginning of the semester and make this need known. Students with disabilities must verify their eligibility through the [Office of Accessibility Services](#), 38 College Park, 419-372-8495.

**Student veteran-friendly campus:** BGSU educators recognize student veterans' rights when entering and exiting the university system. If you are a student veteran, please communicate with your instructor so reasonable accommodations can be made for absence when drilling or being called to active duty

**Religious Holidays:** It is the policy of the University to make every reasonable effort to allow students to observe their religious holidays without academic penalty. In such cases, it is the obligation of the student to provide the instructor with reasonable notice of the dates of religious holidays on which he or she will be absent. Absence from classes or examinations for religious reasons does not relieve the student of responsibility for completing required work missed. Following the necessary notification, the student should consult with the instructor to determine what appropriate alternative opportunity will be provided, allowing the student to fully complete his or her academic responsibilities. (As stated in [The Academic Charter](#))

**University Closure:** In most cases, the University will not close for winter conditions unless the Wood County Sheriff's Department declares a Level 3 emergency. Information about University wide closures is communicated by the Office of Marketing and Communications, which will notify the University Fact Line, local FM & AM radio stations and the four Toledo television stations (see [Weather Policy](#)). For changes in individual class meetings, please refer to the class Canvas site for postings by the instructor.

## Course Contents:

- **Chapter 1 - Introduction to Data**
  - 1.1 - What Are Data?
  - 1.2 - Classifying and Storing Data
  - 1.3 - Investigating Data
  - 1.4 - Organizing Categorical Data
  - 1.5 - Collecting Data to Understand Causality
- **Chapter 2 - Picturing Variation with Graphs**
  - 2.1 - Visualizing Variation in Numerical Data
  - 2.2 - Summarizing Important Features of a Numerical Distribution
  - 2.3 - Visualizing Variation in Categorical Variables
  - 2.4 - Summarizing Categorical Distributions
  - 2.5 - Interpreting Graphs
- **Chapter 3 - Numerical Summaries of Center and Variation**
  - 3.1 - Summaries for Symmetric Distributions
  - 3.2 - What's Unusual? The Empirical Rule and z-Scores
  - 3.3 - Summaries for Skewed Distributions
  - 3.4 - Comparing Measures of Center
- **Chapter 4 - Regressions Analysis: Exploring Associations between Variables**
  - 4.1 - Visualizing Variability with a Scatterplot
  - 4.2 - Measuring Strength of Association with Correlation
  - 4.3 - Modeling Linear Trends
- **Chapter 5 - Modeling Variation with Probability**
  - 5.1 - What is Randomness?
  - 5.2 - Finding Theoretical Probabilities
  - 5.3 - Associations in Categorical Variables
  - 5.4 - Finding Empirical Probabilities
- **Chapter 6 - Modeling Random Events: The Normal Model**
  - 6.1 - Probability Distributions Are Models of Random Experiments
  - 6.2 - The Normal Model

- **Chapter 7 – Survey Sampling and Inference**
  - 7.1 – Learning about the World through Surveys
  - 7.2 – Measuring the Quality of a Survey
  - 7.3 – The Central Limit Theorem for Sample Proportions
  - 7.4 – Estimating the Population Proportion with Confidence Intervals
- **Chapter 8 – Hypothesis Testing for Population Proportions**
  - 8.1 – The Essential Ingredients of Hypothesis Testing
  - 8.2 – Hypothesis Testing in Four Steps
  - 8.3 – Hypothesis Tests in Detail
- **Chapter 9 – Inferring Population Means**
  - 9.4 – Hypothesis Testing for Means

#### Course Learning Outcomes:

1. Select and produce appropriate graphical, tabular, and numerical summaries of the distributions of variables in a data set. Summarize such information into verbal descriptions.
2. Summarize relationships in bivariate data using graphical, tabular, and numerical methods including scatter plots, two-way tables, correlation coefficients, and least squares regression lines. Investigate and describe the relationships or associations between two variables using caution in interpreting correlation and association.
3. Use the normal distribution to interpret z-scores and compute probabilities.
4. Understand the principles of observational and experimental studies including sampling methods, randomization, replication and control. Understand how the type of data collection can affect the types of conclusions that can be drawn.
5. Construct a model for a random phenomenon using outcomes, events, and the assignment of probabilities. Use the addition rule for disjoint events and the multiplication rule for independent events. Compute conditional probabilities in the context of two-way tables.
6. Introduce the concept of a sampling distribution. Discuss the distribution of the sample proportion under repeated sampling (Central Limit Theorem). Students should be expected to simulate or generate sampling distributions to observe, empirically, the Central Limit Theorem.
7. Estimate a population proportion using a point estimate and confidence intervals, and interpret the confidence level and margin of error. Understand the dependence of margin of error on sample size and confidence level.
8. Given a research question involving a single population, formulate null and alternative hypotheses. Describe the logic and framework of the inference of hypothesis testing. Make a decision using a  $p$ -value and draw an appropriate conclusion. Interpret statistical significance.
9. Carry out a hypothesis test for both a proportion and a mean. Interpret statistical and practical significance in this setting and two types of mistakes.

#### **BGP Quantitative Literacy Learning Outcomes** :

1. Interpret mathematical and statistical models such as formulas, graphs, tables, and schematics, and draw inferences from them
2. Represent mathematical and statistical information symbolically, visually, numerically, and verbally
3. Use arithmetical, algebraic, geometric and statistical methods to solve problems
4. Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results
5. Recognize that mathematical and statistical methods are based on assumptions and have limits