



Math 256-02: Probability and Statistics I
SPRING 2024
CRN 6746, TR 11:00-12:15pm at SH107
Course Format: Face-to-face

INSTRUCTOR INFORMATION

Instructor: Pai Song
Title: Assistant Professor of Mathematics
Department: Science and Mathematics
Office: Science Hall 202A
Phone: (304) 462-6156, **Fax:** (304) 462-4136
Email: Pai.Song@glenville.edu

Office Hours: MWF 11-12 & TR 9-30 & R 1-1:30, or by appointment through [email](#). I check my email several times a day and will usually respond within 24 hours.

COURSE DESCRIPTION

Course Description:

Basic concepts of probability and ways of thinking needed to solve problems in probability are related to ideas and areas of application of statistics. Topics include the nature of statistics, organizing data, descriptive measures, basic probability concepts, the normal distribution, the sampling distribution of the mean, confidence intervals for one population mean, and hypothesis testing for one population mean. This course is required for programs in biology, nursing, and education and is highly recommended in a number of pre-professional or graduate programs.

Prerequisites:

A student must satisfy one of the following:

- ACT Math score of 21 or higher
- SAT Math score of 530 or higher
- Any College Math with a grade of C or higher

Course Objectives:

Upon completing this course, the student should be able to ...

1. Organize data into a suitable form, such as grouped frequency tables and histograms, and use it in the calculator of probabilities.
2. Interpret information from a circle, bar, or line graph.
3. Interpret information from a statistical chart or table.
4. Apply principles of mathematical reasoning to make predictions and draw conclusions based on given data.
5. Analyze procedures for collecting, organizing, and recording data as part of a problem-solving process.
6. Find and know the appropriate uses of common measures of central tendency (population mean, sample mean, median, and mode) and dispersion (range, population standard deviation, sample standard deviation, population variance, and sample variance).

7. Find and know the appropriate use of a z-score used as a measure of relative standing.
8. Convert summation notation to expanded form or vice versa.
9. Apply set theoretical concepts in problem solving situations involving probability and/or statistics.
10. Use laws of probability to evaluate the element of chance associated with an experiment.
11. Know when events are mutually exclusive and how to calculate the probability of the union of two events.
12. Distinguish between the sampling distributions of frequently used statistics and apply those sampling distributions to problems of statistical inference.
13. Solve problems using the normal, uniform, and chi-square distributions.
14. Explain the consequences of the Central Limit theorem and why it establishes the importance of the normal distribution in the study of statistics.
15. Construct a confidence interval for a population mean (large sample method).
16. Construct a confidence interval for a normal population mean.
17. Recognize a valid test to determine whether to accept or reject a given null hypothesis.
18. Select the appropriate test statistic and establish the critical region for a test of hypothesis.
19. Calculate the probability of committing a type I error and the power of a test of hypothesis.
20. Use the goodness-of-fit test to determine if a population has a specified theoretical distribution.
21. Formulate and solve problems statistically from both mathematical and everyday situations.
22. Recognize the reasonableness of results
23. Identify the most appropriate computation method for problems in probability and statistics.
24. Evaluate the use of calculators and computers in solving problems in probability and statistics.
25. Identify equivalent representations of statistical information or statistical concepts.
26. Apply probabilistic and statistical terms, symbols, concepts, or principles to describe real-world situations.

Relationship to General Studies Objectives:

Participation in this course will encourage the student to apply mathematical skills in their major area of study; which will better prepared them for employment or additional study in those areas. The course objectives support the following learning goals for general education programs:

- Students will demonstrate the ability to think critically and analytically and to formulate informed, reasoned opinions.
- Students will demonstrate a logical approach to solve mathematical problems.

Relationship to National and State Standards for Teacher Education:

The course objectives support national association and state standards for the teaching and learning of mathematics. Participation in this course will encourage the student to develop a thorough understanding of the fundamental concepts of statistics and probability, and it will include discussions on problem-solving skills and pedagogical insights into teaching statistics and probability at different programmatic levels. Students will develop skills in writing statistical arguments and drawing valid conclusions based on these statistical arguments.

Relationship to Mathematics Minor:

This course will provide opportunities for students in the mathematics minor “to broaden and deepen their mathematics experiences and skill.” Participation in this course will encourage the student to apply mathematical skills in their major area of study; which will be better prepared them for employment or additional study in those areas. The course objectives support the following learning outcomes for the mathematics minor:

- Design investigations, collect data, and use a variety of ways to display data and interpret data representations.
- Use statistical inferences to draw conclusion from data.
- Identify misuses of statistics and the drawing of invalid conclusions from probability.
- Determine and interpret confidence intervals and P-values.
- Develop and evaluate mathematical arguments and proof.

Teaching and Learning Activities:

The instructional methods for this course include: instructional videos, selected readings, independent study by the student, homework, discussion questions, handouts, guided practice, individual research, problem solving, and/or study sessions.

COURSE REQUIREMENTS

E-Textbook w/Online Assignments: Triola, M.F. (2023). MyLab Statistics for Essential of Statistics (7th edition). New York,

“Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world.”

NY: Pearson Addison-Wesley. ISBN: 9780137466092

Other Materials:

The following supplies are required for this course: pencil/pen, paper, Microsoft Word, Microsoft PowerPoint, Microsoft Excel, and a TI-83/84 graphing calculator. You will also need access to reliable internet in order to view the instructional resources and to submitted assignments to BrightSpace/MyLab Math. The following supplies are highly recommended but not required: binder, notebook, and graph paper.

Grading System:

Course grades will be based on homework, quizzes, midterm exam and final exam. The point values are given below:

Participation (5%): Class participation will be based on class attendance, discussion of selected topics, and in-class problem solving. You are expected to participate and attend every class session; missed class sessions will result in a zero on in-class exercises and/or class discussions.

Homework (25%): Practice is essential for developing the skills necessary for successful completion of this course. Homework will be assigned regularly on MyLab Math.

Quizzes (20%): 10 Quizzes will be given throughout the semester on MyLab Math based on homework assignments.

Tests (30%): Throughout the semester, you are required to complete a total of THREE tests. You have the flexibility to choose between two distinct examination formats for each test, or you may opt to take both. If you take both, the higher grade of the two will be recorded as your test score.

1. In-Class Paper Examination: In this format, you will answer questions on paper during a scheduled class session. This exam primarily focuses on basic concepts and computations, allowing you to demonstrate your foundational understanding and skills in a traditional testing environment.
2. Online Examination: This exam will be conducted through your homework platform under exam settings. The online examination is designed to challenge you with more complicated computations and advanced problem-solving tasks, testing your ability to apply concepts in more complex scenarios.

Key Points:

- You are given a single attempt for each test.
- Each (both in-class and online) has a time limit of one hour.
- Your grade will be based on accuracy and the depth of your mathematical reasoning.
- It's imperative that you show all your work steps and/or clearly explain your reasoning to be eligible for full credit.
- For specifics on how partial credit will be awarded, please refer to the departmental grading rubric.
- You are permitted to use a calculator and notes during the in-class exam.

Important Note: All students must take the exam on the designated date. Extensions will not be granted if you have completed either version of the exam. This policy ensures fairness and maintains the integrity of the testing process.

Final Exam (20%): [Comprehensive Final Exam](#): The final examination for our Probability and Statistics class will be held on **Wednesday, May 2nd**, and will be comprehensive, covering all topics and materials discussed during the semester. It will be conducted in an in-class paper format, and you will have two hours to complete it. This exam is mandatory, and any student failing to appear will receive a "Fail due to Insufficient Work" (FIW) grade, unless prior arrangements for a grade of "Incomplete (I)" have been established. You are given only one attempt, and the exam must be taken on the scheduled date, unless you have made prior arrangements with the instructor. Ensure you're well-prepared and punctual.

Grading Scale: 100 – 90% A, 89.9 – 80% B, 79.9 – 70% C, 69.9 – 60% D, 59.9 – 0% F

Grading Policies: It is your responsibility to complete all assignments and take all tests and exams on or before the due date. Any person who must miss a scheduled exam because of an official college function as deemed by the Office of Academic Affairs must reschedule with the instructor; otherwise, the student will not be given an opportunity to make-up the exam. Late assignments will not be accepted, unless other arrangements have been made.

Departmental Grading Rubric:

Problems on module tests and exams will be graded on accuracy and mathematical reasoning. You must show all work and/or explain your reasoning to receive full credit. Below is the departmental rubric used for grading each problem on each module test and/or exam:

"Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world."

Weekly Schedule of Reading and Other Assignments:

The outlined course readings and assignments may change throughout the semester; however, the topics outlined below will be followed as closely as possible. Changes in the schedule may occur due to unforeseen circumstances; you will be notified of the changes to the schedule and/or assignments by your instructor.

Course Schedule is available on class [website](#).

Make-Up Work Course Policy:

It is your responsibility to complete all assignments and take all tests/exams **on or before the due date**. Late online assignments will be accepted with penalty (**5% deduction per day, this is only for the questions completed after the due date**), unless PRIOR arrangements have been made with the instructor. **Any person who must miss a scheduled test and/or exam because of an official college function as deemed by the Office of Academic Affairs must reschedule with the instructor PRIOR to the function; otherwise, the student will not be given an opportunity to make-up the test and/or exam.**

Note: For online program students, you must take the proctored tests/final on campus if you live on campus or within 50 miles of campus; others you will have an approved proctor. Proctor form will be provided by your course instructor.

Internet service/Hardware/Software Needed:

For GSU on campus students but live off campus, or any students who are absent due to quarantine/institutionally approved reasons, you will need access to a computer (a laptop or a desktop) with an internet connection to be able to access the resources and homework assignments on MyLab Math.

For online program (all courses are web-based) students, you will need access to a computer (a laptop or a desktop) with an internet connection to be able to access the resources and homework assignments on MyLab Math, and a webcam to use Lockdown Browser.

Attendance Course Policy:

Attendance is required for all classes. To be in compliance with federal guidelines, students are expected to be present at all class sessions to be eligible for financial aid through Title IV of the Higher Education Act of 1965. It may be necessary for the student to be absent from scheduled classes or laboratories for personal reasons. On such occasions, all matters related to a student's absence are to be arranged between the student and the instructor, including making up missed work. The student is responsible for the academic consequences of any absences. **Absence from more than 3 class meetings will be grounds for removal from the class.**

Occasionally, students may be absent from scheduled classes to participate in officially sanctioned college activities referred to hereafter as institutional absences. Instructors are obligated to respect institutional absences and may not penalize a student for such an absence if said students make up any graded work missed due to the absence in a timely manner as determined by the instructor. An institutional absence does not change deadlines for submitting assignments, but faculty will allow students to make up exams, quizzes, presentations, or any other course requirements that have an impact on the course grade conducted during the missed class(es). Students are responsible for all coursework missed due to absences and must initiate any request to make up coursework in a timely manner, as stipulated by the instructor on their syllabi. Instructors must allow students missing class for institutional absences to make up any work conducted in class but, at the discretion of the instructor, may assign alternate, equivalent work. Instructor accommodations for requested make-up work must be reasonable and timely; such accommodations may be made prior or subsequent to the institutional absence at the discretion of the instructor. A list of students who are excused during a specific time period will be maintained by the Office of Academic Affairs and circulated to instructors.

In addition, instructors may excuse absences due to extenuating circumstances beyond student control, as though they are institutional absences. However, if an instructor chooses to excuse such absences, they must excuse them consistently for all students. Furthermore, at the instructor's discretion, an instructor may require the student to provide documentation of the circumstances leading to the absence and approve or deny the request for an excused absence based on said documentation.

At the beginning of each semester, all instructors will provide in the course syllabi a clearly written statement to all their classes regarding their policies in handling absences. Students and instructors are obligated to adhere to the stated requirements of each course. An instructor's attendance policy may not contradict institutional policy.

"Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world."

Additionally, attendance is required for all online courses. Attendance is defined as active and timely participation and submission of assigned coursework, discussions, exams, or other materials as defined by course instructors. Logging into a course does not constitute attendance. In order to document attendance for financial aid purposes, students must submit an assignment during the first week of scheduled classes. Students who stop attending an online course after week one may remain enrolled in the course or instructors may initiate policy procedures for Administrative Withdrawal as outlined in the Glenville State University Catalog. Guidelines for the duration of non-attendance will be outlined in the course syllabus. Students must complete the proper withdrawal procedures if they wish to withdraw from the course prior to the last day to withdraw from an individual course with a grade of W. Students who stop attending a course or courses after the first week and who do not officially withdraw or who are not administratively withdrawn will receive a grade of FIW (Failure due to Irregular Withdrawal).

Online students may have approved institutional absences that conflict with the due date of assigned work. Students are responsible for keeping track of assignment deadlines that may occur during institutional absences and make prior alternative arrangements with their instructor to complete these assignments.

***Note: Faculty are expected to report excessive absences to the Office of the Registrar on a regular basis.**

Withdrawal Information:

If for any reason you believe that you may be unable to complete the course, please talk with your instructor and/or advisor before withdrawing from the course. The withdrawal deadline is [Friday, March 15, 2024](#).

Academic Dishonesty:

Glenville State University requires adherence to the University's standards of academic integrity. While every case of academic dishonesty cannot be listed exhaustively, the following examples represent some basic types of behavior that are unacceptable and also represent those items for which students may be sanctioned.

1. *Cheating*: using unauthorized notes, mechanical or electrical devices (calculators, PDAs, cell phones, etc.), study aids, or information on an examination; making unauthorized changes to graded work and misrepresenting those changes as instructor grading error; allowing another person to do one's work and submitting that work under one's own name; submitting identical or similar papers for credit in more than one course without prior permission from the course instructors.
2. *Plagiarism*: To plagiarize is, according to *Webster's Third New International Dictionary*, "To commit literary theft." Writers or speakers plagiarize if they use words, ideas, or arguments, of another and make it appear that these materials are their own. To avoid the charge of plagiarism when using materials derived from another, the writer should follow accepted conventions of punctuation, indentation, and documentation. A handbook of composition will provide a list of these conventions.

Glenville State University defines Plagiarism as:

1. Quoting material from a particular source, such as a text, article, or Internet page, or email, without indicating the source and without placing the directly quoted material within quotation marks;
2. Taking the ideas or arguments of another person without acknowledging the source of the ideas or arguments;
3. Substituting synonyms for an author's words but preserving the sentence structure or mixing the author's words or phrases within the paraphrasing and failing to put the author's words in quotation marks. Citing the source does not excuse you from the charge of plagiarism;
4. Using a theme (paper or essay) or portion of a theme written by someone else. For example, plagiarism occurs if an individual takes or purchases an essay from an Internet service or uses someone else's essay from a previous semester or another class.

Any assignment that is turned in either for credit or review that has been plagiarized will be subject to sanctions of academic dishonesty.

3. *Fabrication*: falsifying or inventing any information, data or citation; presenting data that were not gathered in accordance with standard guidelines defining the appropriate methods for collecting or generating data and failing to include an accurate account of the method by which the data were gathered or collected.
4. *Obtaining an Unfair Advantage*: (a) stealing, reproducing, circulating or otherwise gaining access to examination materials prior to the time authorized by the instructor; (b) stealing, destroying, defacing or concealing library materials with the purpose of depriving others of their use; (c) unauthorized collaborating on an academic assignment (d) retaining, possessing, using or circulating previously given examination materials, where those materials clearly indicate that they are to be returned to the instructor at the conclusion of the examination; (e) intentionally obstructing or interfering with another student's academic work, or (f) otherwise undertaking activity with the purpose of creating or obtaining an unfair academic advantage over other students' academic work.

"Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world."

5. *Aiding and Abetting Academic Dishonesty*: (a) providing material, information, or other assistance to another person with knowledge that such aid could be used in any of the violations stated above, or (b) providing false information in connection with any inquiry regarding academic integrity.

6. *Falsification of Records and Official Documents*: altering documents affecting academic records; forging signatures of authorization or falsifying information on an official academic document, grade report, letter of permission, petition, drop/add form, ID card, or any other official University document.

7. *Unauthorized Access*: to computerized academic or administrative records or systems: viewing or altering computer records, modifying computer programs or systems, releasing or dispensing information gained via unauthorized access, or interfering with the use or availability of computer systems or information.

*All students must sign and date a copy of the Academic Dishonesty Policy.

Academic Misconduct Statement:

Disorderly and/or disruptive behavior in the classroom setting may result in an academic penalty such as final course grade, grade penalty, exclusion from class, etc. when the course instructor has provided written notice to the student. Such notice may be provided via the course syllabus or specific written notification (with copy to advisor). Any member of the campus community may also file an incident report regarding alleged misconduct with Student Affairs for possible sanction in accordance with the Student Conduct Code. Appeals of academic penalty will be referred to the Academic Appeals Panel and will be governed by the Student Academic Grievance Policy. Appeals of sanctions imposed under the Student Conduct Code will be reviewed in accordance with the processes outlined in the Code (see Student Handbook for details). Incident reports of alleged student misconduct are permanently maintained in the Office of Student Affairs.

Electronic Digital Communication Device Use Statement:

Glenville State University values the time and effort involved in the learning process. Interruptions caused by rings and musical selections from electronic digital communication devices interrupt and disrespect the opportunities for student learning in the classroom environment.

When in the University classroom, all electronic digital communication devices must be turned off and out of sight. Laptop computers may be used only for course-related activities with instructor permission. There may be no conversations via electronic digital communication device, whether audible or text-messaging, while in the Glenville State University classroom. In an emergency situation, the instructor may give a student permission to use an electronic digital communication device.

The instructor has the right to ask the student to leave the classroom for the remainder of the class period if the student uses an electronic digital communication device during class. If the student leaves the room to speak on an electronic digital communication device, it is at the instructor's discretion as to whether or not the student may return to the classroom when the conversation is completed.

Study Expectations:

You are expected to participate in each class session, and you are expected to spend a minimum of 6 additional hours each week for completing activities that are directly related to this course, such as: problem sets, select readings, instructional videos, and studying for tests and exams. Please note that this expectation is a minimum expectation. It is your responsibility to budget your time to complete the course. It is your responsibility to email and notify the instructor if you are having difficulties in completing assignments or if something arises in your schedule that will briefly keep you from progressing.

Assignment Expectations:

You should make the work which you submit as neat and organized as possible. This makes it easier for you to review it later, and it makes it easier for your instructor to grade. You are also less likely to make mistakes if your work is well organized and legible. The instructor may return work for revision which is sloppy, difficult to read, or which needs re-organized. In extreme cases, the instructor may require a student to type his or her work.

Calculator Usage:

Graphing calculators at or below the level of a TI-84 Plus are required for this course. Any student using a calculator other than a TI-84 shall inform the instructor of the model being used, and the student must receive approval for its use. Students using an approved calculator other than the TI-84 Plus are responsible for its proper operation and use. TI-89 calculators or other computer algebraic systems (CAS) are not allowed; in addition, calculators on cell phones, iPods, tablets, or any other devices are not allowed (except with permission from the instructor for in-class activities). It will be considered cheating if you use a non-approved device on an exam; in addition, sharing a calculator with another student(s) during an exam will be considered cheating for all individuals involved. Calculators will not be provided so it is your responsibility to bring one to class. You may rent a calculator from the Science and Math Department, if you do not wish to purchase one. The Science and

"Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world."

Math Department will rent calculators on a first-come-first serve basis. Students wishing to rent a calculator will be asked to provide a deposit of \$60 for the cost of the calculator; upon return of the calculator in working condition at the end of the course all but \$10 of the deposit will be refunded to the student.

Food/Drink:

No food and/or drinks are allowed in the classroom at any time.

Other Course Policies:

- Be on time. Once the door is closed, tardy students may not be admitted.
- Notify the instructor if you plan on being absent from a class.
- NO assignments will be reset on MyLab Math. It is your responsibility to complete all work on time.
- Don't wait until the last minute to complete on line assignments, technology has not been perfected.
- The use of any electronic devices is STRICTLY PROHIBITED (Calculators are an exception).
- Disruptive or disrespectful behavior WILL NOT be tolerated.
- Absences on exam days will result in a grade of ZERO. NO MAKE-UP EXAMS WILL BE GIVEN. It is your responsibility to notify instructor in advance of absence on exam day.

Tutoring/Additional Support:

There are several tutoring/support services available if you are having difficulties in completing course assignments and/or studying for tests/exams.

- Departmental tutoring will be available to any students enrolled in a mathematics course at Glenville State University. The departmental tutoring program will consist of peer tutors and instructors, and it is located in the Robert F. Kidd Library on the first floor.
- Students are encouraged to use the instructor's office hours for additional support in the course. Special study sessions may be available.
- Tutoring service are also available at the Academic Success Center located on the third floor of the Robert F. Kidd Library
- Instructional videos on MyLab Math will be available throughout the semester.
- Some students (members) may be eligible for tutoring through the Student Support Services.

ADA Students Statement

"It is the policy of Glenville State University to provide reasonable accommodations for qualified individuals with documented disabilities. This University will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations with regard to affording equal educational opportunities. It is the student's responsibility to provide documentation of a disability to the Academic Success Center located on the third floor of the Robert F. Kidd Library. The staff will assist students and faculty in arranging appropriate accommodations. This is in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990."

Course Evaluations

Course evaluations are a critical way for students to share constructive criticism with faculty about the class. Students are encouraged to share what they felt were strengths and areas of improvement in the course. All student comments are collected anonymously.

University-wide Policies

All university policies are in effect during this course for relevant policy and procedures in the classroom.

Reserve Clause

The instructor reserves the right to revise, alter, or amend this syllabus as necessary. Students will be notified in writing / e-mail of any such changes.

Force Majeure

The duties and obligations of Glenville State University may be modified or suspended immediately and without notice because of force majeure causes beyond Glenville's reasonable control and occurring without its fault or negligence including, but not limited to, acts of God, fire, war, governmental action, terrorism, epidemic, pandemic, weather, national emergencies, or other threats to the safety of students, faculty, or staff. If such an event occurs, Glenville's duties and obligations may be modified, suspended, or postponed until such time as Glenville, in its sole discretion, may safely resume

"Glenville State University prepares and inspires students to be thoughtful, productive, engaged, and responsible citizens who contribute to the well-being of their community, state, nation, and world."

operations. Glenville may, at its option, and in its sole discretion, alter the academic year schedule or provide alternate means of instruction, including, but not limited to, distance or remote learning.