

Brooklyn College
Department of Mathematics
Elements of Statistics with Applications

Instructor: Gregory Barco

E-mail: Gregory.Barco@brooklyn.cuny.edu

Course: Math 1501 — Elements of Statistics with Applications

[Brooklyn College Bulletin](#)

Class Meetings: Online Synchronous (Zoom) — Monday & Wednesday, 9:30 a.m. – 10:45 a.m.

[Zoom link here and also at the bottom of the syllabus.](#)

Zoom link is posted on [my webpage: barcogregory.com/students](http://mywebpage:barcogregory.com/students).

Zoom link will be posted on [BrightSpace \(TBA\)](#).

Office Hours: Online, via Zoom, Monday, Wednesday at 10:45 a.m. – 11:15 a.m. (Immediately After Class)
Same Zoom link as class meetings.

Mode of Instruction: Online synchronous, with **online midterms** and an **in-person final exam**.

Synchronous class meetings will be held at the regularly assigned time through video-conference using Zoom, except on the following in-person meeting dates:

- **Online midterm exams using MyOpenMath** during a designated exam window:
Midterm 1 is on Wednesday, October 14, 2026. Available from 9:30AM - 11:59 PM.
Midterm 2 TBA.
- **In-person final exam:** Date, time, and room [TBA].

MyOpenMath: Learning Platform, hosting Homework, Assignments, and Midterms.

- **Course:** MATH1501 – Fall 2026 M/W
- **Course ID:** 350635
- **Enrollment Key:** Fall2026
- **First homework due:** Wednesday, September 23, 2026, 11:59 p.m. EST

How to enroll in MyOpenMath:

1. Go to myopenmath.com and create an account (or sign in if you already have one).
2. On the left side of the screen, locate **Courses you're taking**.
3. Click **Enroll in a New Class**, then enter the Course ID and Enrollment Key above.
4. Return to the main page and click the course name to access the course.

- **I will update this syllabus and tell you when the dates and times are known.**
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Course Description:

3 hours; 3 credits

Satisfies Pathways Required Core Mathematics and Quantitative Reasoning (MQR) requirement.

This course uses mathematical models (formulas, graphs, tables, and schematics) and empirical analysis (statistical inference, sampling, and modeling) to analyze data and draw statistically valid conclusions. Statistics is the science of obtaining and interpreting data — hence we will approach this course more like a science course than a traditional math course. We will focus on three distinct areas: producing, analyzing, and making inferences from data. This course will emphasize data analysis and inferential statistics: **which is a widely desired skill in the developing job market.**

Course Objectives:

By the end of this course, you will be able to:

- Analyze and validate datasets to create and **present visualizations** of your own statistical findings.
- Utilize **Python** (via Google Colab) for statistical computation, automation, and graphing.
- Compute measures of central tendency, variability, and **point estimates** to summarize large datasets.
- Determine whether graphs and statistical claims are misleading or misrepresented.
- Apply basic probability, including independent and dependent events.
- Analyze and interpret **sampling distributions**, the **normal distribution**, the **Student t -distribution**, and skewed distributions.
- Understand and use **linear regression** to uncover patterns and relationships hidden in data.
- Calculate and interpret **confidence intervals** and standardized statistics (z -scores and t -scores).
- Conduct **hypothesis testing**, understand the logic behind p -values, and identify Type I and Type II errors.

Prerequisite Note: Not open to students enrolled in or having completed math courses 2501 or higher, BUS 3400, ECON 3400/3422, or PSYC 3400/2600. For full details, view the [Official Course Catalog](#).

Textbook & Technology:

Textbook: *Introductory Statistics 2e*, OpenStax (Free)

[Online Platform](#) | [PDF Download](#)

Technology: A computer or tablet with internet access, a functioning webcam, and a microphone is required to participate fully in this course. You may use whatever calculator you desire.

- **Calculator:** TI-83/TI-84 recommended.

An online version of this calculator is on my website at: barcogregory.com/students; any calculator is acceptable. A free [Desmos Online Graphing Calculator](#) is also available.

- **Python:** We will use [Google Colab](#) for statistical computation and visualization (free, runs in your browser — no installation needed).

Since we are waiting for BrightSpace access, all materials will be posted on my website for now. I will make sure to email you when I post on my site and I will reiterate during class, while BrightSpace is being fixed for us.

- **BrightSpace:** All course materials, announcements, assignment postings, and Zoom links will be on [BrightSpace](#) (CUNY's official LMS). Please make sure your CUNY e-mail address is current in CUNYFirst, as I will use it to send course announcements. For help with BrightSpace, visit [Brooklyn College BrightSpace Support](#) or e-mail helpdesk@brooklyn.cuny.edu or call 718.951.4357. When our BrightSpace is up and running, I will explain how we will be transitioning to it.

Topics to Be Covered (mapped to OpenStax: *Introductory Statistics 2e*):

1. **Data, Sampling, and Descriptive Statistics** (Chapters 1–2)
Definitions of statistics, probability, and key terms; classifications of data and levels of measurement; sampling methods and variation from the expected average/mean; line graphs, bar graphs, histograms; measures of central tendency (mean, median, mode); measures of variability; how to identify misleading graphs.
2. **Probability** (Chapter 3)
Terminology and basic probability rules; mutually exclusive events; independent and dependent events.
3. **Discrete Random Variables** (Chapter 4, selected sections)
Probability distribution functions for discrete random variables; mean (expected average value) and standard deviation; the binomial distribution; the Poisson distribution.
4. **Continuous Random Variables** (Chapter 5)
Properties of continuous distributions; the uniform distribution; the exponential distribution.
5. **The Normal Distribution** (Chapter 6)

The normal distribution and its properties; using the normal distribution; z -scores and standardization.

6. **The Central Limit Theorem** (Chapter 7)

The central limit theorem for means and proportions; sampling distributions.

7. **Confidence Intervals** (Chapter 8)

Point estimates; confidence intervals for means and proportions.

8. **Linear Regression and Correlation** (Chapter 12)

Scatterplots and correlation; least-squares regression; interpreting slope and intercept; residuals.

Note: This topic is covered before formal hypothesis testing because regression is a natural, visual extension of describing data. Once you can find a trend line, the next question is: "Is this relationship real?" — which leads directly into hypothesis testing.

9. **Hypothesis Testing** (Chapter 9)

Null and alternative hypotheses; p -values and statistical significance; Type I and Type II errors; one-tailed and two-tailed tests; the Student t -distribution and t -tests.

This schedule is a guideline. Adjustments may be announced in class as the semester progresses.

Class Attendance:

Attendance will be taken in some form during every class meeting; (on day one we had a survey, and we plotted the responses). **Cameras are suggested to be on.** I would like to see if you are following along by a head nod or a thumbs up. Some sort of sign that you're alive. I recommend you attend all lectures. I will give essential information in class that you would not become aware of otherwise. The syllabus is only a rough guideline and you will need to come to class to know what is actually being covered. If you have to miss a class, make sure you get lecture notes from someone else taking the course.

If you face technical issues or a deficiency with your camera, you are expected to actively participate via microphone or chat. Students who actively participate tend to learn better than those who do not.

Work Outside of Class: Expect to devote roughly 1 hour per course credit per week to course content outside of class (i.e., approximately 3 hours per week for this 3-credit course).

E-mail Communication:

I will share information with you by e-mail under the assumption that you check your e-mail at least once a day, so please make sure you do so whenever possible. Feel free to e-mail me with any course-related questions. I will try to respond within 24 hours.

Grading Policy:

Your course grade is composed of a **Non-Exam Component (50%)** and an **Exam Component (50%)**.

Non-Exam Component (50%):

- Attendance & Participation: 10%
- Homework & Problem Sets: 15%
- Python / Data Labs: 10%
- Pathway Project: 15%

Exam Component (50%):

Your exam portion will be based on the highest of the following three calculations:

- **Score 1:** Two midterms at 12.5% each + final exam at 25%.
- **Score 2:** Best midterm at 12.5% + final exam at 37.5%.
- **Score 3:** Final exam at 50%.

Meaning that: lowest grades will be dropped, under the provision that the final counts more towards your exam grades.

Except for the cases listed, your final course grade will be based on the sum of your Non-Exam Component

and the highest of Score 1, Score 2, and Score 3. Your letter grade will be determined by the standard CUNY Brooklyn College undergraduate grading scale, with the following defined ranges:

Grade	Range	Grade	Range	Grade	Range	Grade	Range	Grade
A+	[97, 100]	B+	[87, 90]	C+	[77, 80]	D+	[67, 70]	F
A	[93, 97)	B	[83, 87)	C	[73, 77)	D	[63, 67)	[0, 60)
A-	[90, 93)	B-	[80, 83)	C-	[70, 73)	D-	[60, 63)	

Rounding Policy: Final course grades will be rounded to one decimal place using standard rounding (e.g., 89.95 rounds to 90.0; 89.94 rounds to 89.9). **I will not manually round or adjust grades beyond this.** An 89.9 is a B+; a 90.0 is an A-. The boundaries above are exact. Please do not e-mail me at the end of the semester asking for a grade bump — the grading scale is defined here, and I apply it uniformly to everyone.

The final grade **will not be curved**. Additional policies:

- If you score **below 40%** on the final exam, you will receive a **failing grade** in the class.
- If you score **below 50%** on the final exam, your grade will be **no higher than a D+.**
- If you score **below 60%** on the final exam, your grade will be **no higher than a C+.**

These grading policies exist because the final exam is cumulative and reflects your overall understanding of the course material. No exceptions will be made.

Homework & Problem Sets (15% of Grade):

I will make custom problem and you will submit them directly via **MyOpenMath**. Please check your email regularly for all assignment postings and due dates.

Keep in mind that you may not be able to solve every problem in 5 to 10 minutes. Some problems are challenging, but doable if you put enough time and thought into them. Be determined and your main takeaway will be usable skills applicable to everyday life.

Python / Data Labs (10% of Grade):

Throughout the semester, we will complete short, guided data labs using **Python** in [Google Colab](#). These labs are designed to give you hands-on experience working with real data — computing statistics, generating graphs, and automating calculations. No prior programming experience is required; you will be walked through each lab step by step. These are meant to be straightforward and collaborative: if you show up, follow along, and submit your work, you should expect to do well.

The Pathway Project (15% of Grade) — Data skills are in high demand. Add this to your resume:

You will have an *application of statistics* project utilizing real-world datasets, such as US Census data or specific data sources provided to you. You will compute statistics, build basic models and graphs, write up your results, and make a short slideshow. **If time permits, we will spend some class time presenting — only if you are proud of your work and want to show it. This is the only extra credit I will give you.**

Brooklyn College has five schools: Business, Education, Natural and Behavioral Sciences, Humanities and Social Sciences, and Visual, Media and Performing Arts, so I will try to be as inclusive as possible so that this project is relevant to your major and looks good on your resume for internships you may search for. Examples may include: **Business/Finance:** Market trends. **Education/Social Science:** Demographic data. **Science/Arts:** Biological measurements or media trends.

Exams:

Both midterms will be held **online** during a designated exam window. The final exam will be held strictly **in person**. Exact midterm dates and final exam room will be announced once finalized.

- **Midterm Exam 1:** *Wednesday, October 14, 2026* — Online, 2 hours, open 9:30AM - 11:59 PM
- **Midterm Exam 2:** *[Date TBA]* — Online
- **Final Exam:** *[Date, Time, Room TBA]* — In Person

Note Sheet Policy (Final Exam): You will be allowed **one handwritten index card** (front and back) of your own notes for the final exam. A formula reference sheet may also be provided. The final exam will test your ability to *apply* what you have learned — not memorize formulas. Writing out your own note card is itself one of the best study strategies you can use.

Leaving the Classroom During Exam Time: Bathroom? No need to ask. Medical reasoning? Let me know.

Make-up Tests: I will not give make-up tests. If you miss a midterm due to an unforeseen emergency, you must notify me within 48 hours with appropriate documentation. If approved, your final exam grade will fill in for the missed midterm (as reflected in Scores 2 and 3 above). If you fail to follow these guidelines, a score of zero will be given for the missed exam, and the provision that the final exam grade fills in will not apply — the zero will be counted in the calculation of your grade. **There is no make-up final exam. This is per the department.**

Artificial Intelligence (AI) Policy:

You may use whatever tools you wish to assist your learning; however, **the goal is for you to do the thinking**. You are welcome to use AI as a study tool — it can help you understand concepts and check *some of* your reasoning. However, be advised that an AI or more specifically a ([Large Language Model](#)) is not as logically rigorous as a human mathematician, and it frequently lacks the mathematical nuance and detailed reasoning that your professors **are aware of and can notice**. Your submitted work must reflect your own logic and thought process. Submitting AI-generated content as your own work is a violation of academic integrity and will be treated accordingly.

Academic Integrity:

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy can be found at www.brooklyn.edu/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member **MUST** report the violation. Students should be aware that faculty may use plagiarism detection software.

My Policy: Zero tolerance for plagiarism, cheating, or submitting AI-generated content as your own work. Violations result in a zero on the assignment and referral to the Office of Student Affairs for further disciplinary action, which may include failure of the course.

Recording Policy:

I'll record lectures and post them. Video and/or audio recording of class lectures and review sessions without the advance consent of the instructor is prohibited. Distribution of recordings without written permission of the instructor is also prohibited. Students with approved accommodations from CSDS permitting the recording of class meetings must present the accommodation letter to the instructor in advance.

Institutional Policies & Student Resources:**Center for Student Disability Services (CSDS):**

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services (CSDS). Students who have a documented disability or suspect they may have a disability (physical or mental condition which substantially limits one or more major life activity) are invited to call the Center at (718) 951-5538 or visit 138 Roosevelt Hall. If you have already registered with the CSDS and submitted necessary forms, you will receive your course accommodation letter to provide to your professor. You may also e-mail Josephine.Patterson@brooklyn.cuny.edu.

Title IX & Non-Discrimination:

Brooklyn College is committed to fostering a safe, equitable, and productive learning environment. Students experiencing any form of prohibited discrimination or harassment on or off campus can find information about the reporting process, their rights, and confidentiality on the Office of Diversity and Equity Programs website. Reports of sexual misconduct or discrimination should be made to Danielle Haynes, Chief Diversity Officer (718.951.4128) or Michelle Mendez, Title IX Coordinator (718.951.4128), and may also be made to Public Safety (718.951.5511) or the NYPD (911).

Religious Observance:

Students absent for religious beliefs will be excused and provided an equivalent opportunity to make up missed assignments (NYS Education Law Title I, Article 5, Section 224-a).

Student Bereavement Policy:

Please refer to [Brooklyn College's Student Bereavement Policy](#) regarding absences due to bereavement.

Support for Student Wellness and Welfare:

- **Personal Counseling Center** (0203 James Hall): Individual and group counseling, emergency support. Call 718.951.5363 or e-mail BCPersonalCounseling@gmail.com.
- **Immigrant Student Success Office** (117 Roosevelt Hall): Immigration-informed academic and non-academic support, including legal services. Call 718.951.5023 or e-mail ISSO@brooklyn.cuny.edu.
- **LGBTQ+ Resource Center** (219 Student Center): Support for LGBTQIA+ students, staff, and faculty. Call 718.951.5739 or e-mail LGBTQCenter@brooklyn.cuny.edu
- **Women's Center** (227 Ingersoll Hall Extension): Multidimensional support addressing emotional, intellectual, physical, and financial well-being. Call 718.951.5777 or email womenscenter@brooklyn.cuny.edu
- **Health Clinic** (114 Roosevelt Hall): Primary care, free of charge for enrolled students. Call 718.951.5580 or e-mail bchealthclinic@brooklyn.cuny.edu
- **The Learning Center Learning Center** (1300 Boylan Hall): Free tutoring. See their schedule on their linked site. Contact: lc@brooklyn.cuny.edu or call 718.951.5821.
- **Need other help?** Use the “Hand Raise” button in Navigate for academic advisement, technology, financial concerns, food and housing assistance, and more.

Important Dates (Fall 2026):

Aug 28	First Day of Fall Classes (Fri)	Nov 2	Black Solidarity Day*
Aug 31	First MW Class Meeting	Nov 6	Last Day to Withdraw with “W”
Sep 3	Last Day to Add/Swap Courses	Nov 8	No Classes Scheduled
Sep 7	College Closed (Labor Day)	Nov 25	No Classes Scheduled
Sep 11–13	No Classes Scheduled	Nov 26–27	College Closed (Thanksgiving)
Sep 21	No Classes Scheduled (Yom Kippur)	Dec 14	Last Day of Undergraduate Classes
Oct 12	College Closed (Indigenous Peoples' Day)	Dec 15–21	Final Examination Period
Oct 13	Conversion Day (Tue follows Mon schedule)	MATH 1501 Midterms and Final Exam [Date TBA]	

*Faculty are asked not to schedule special events or exams on Black Solidarity Day.
The full academic calendar is available on the [Office of the Registrar's website](#).

ZOOM ACCESS INFORMATION

Join Meeting: [Click to Join Zoom Link](#)

Meeting Chat: [Direct Link to Meeting Chat](#)

Meeting ID: 831 1602 7278

Passcode: 756602

The Zoom link for class meetings and office hours has been sent in a first email prior to class start on August 28, 2026, is posted on my website, and will be posted on Brightspace (once available) as mentioned throughout this document.

This document will be updated as required when more information is available.