Montgomery College
Mathematics, Statistics, and Data Science
Syllabus – DATA 201 Statistical Methods in Data Science
In-Person/Remote – Spring 2026

Quick Reference

Contact me	**Class Location Days, and Time,CRN**	**Meet with me**	**Course Materials**
Dr. Rebin Muhammad Rebin.muhammad@montgomerycollege.edu **Office Phone:** **Office:** 240-567-1915	**Room:** online **Days/Time:** 6:00 PM - 9:05 PM **CRN:** 31975	**Office Hours:** **MWF: 10:30am-11am and 12:30pm-1:30pm** **TR: 11:30-12:30 online** **Office:** Germantown HT, 223	PDF and online textbooks via Blackboard Other
Free Tutoring opportunities Ackerman STEM Learning Center	Accessibility Disability Support Services (DSS)	Student Support Veteran's Services College Title IX Webpage Food Assistance Mental Health and Wellness Resources COVID19 Guidelines	Important Dates Last day for a refund: 02/12/26 Last day to drop without a grade: 02/26/26 Last day to drop with a W: 04/21/26 Final Exam: 05/14/26

Key Dates

Project 1	Thu, Mar 12, 2026
Project 2	Thu, Apr 2, 2026
Final Project and Presentation	May 14, 2026

Course Grade Evaluation	
Participation	10%
Assignments	15%
Project 1 + Presentation	20%
Project 2 + Presentation	25%
Final Project and Presentations	30%

Course: DATA 201 **CRN Number :** 31975 **Days/Time Room**: Thursday 6:00 PM - 9:05 PM **using MS team.** **Office Hours: : MWF: 10:30am-11am and 12:30pm-1:30pm and TR: 11:30-12:30 online**	**Instructor:** Dr. Rebin Muhammad **Email:** Rebin.muhammad@montgomerycollege.edu **Office Phone:** 240-567-1915 **Office: :** Germantown Campus HT, 223 **LinkedIn:**

Course Overview

Description: Statistical concepts and applications related to data science including advanced exploratory data analysis, nonparametric inference and simulation for larger datasets, logistic regression modeling, statistical programming, and basics of machine learning. PREREQUISITE(S): A grade of C or better in DATA 101 or consent of department.

Course Outcomes:
Upon course completion, students will be able to:

- Select appropriate existing analytical and presentational tools for specific analyses of large databases.
- Develop new and appropriate analytical and presentational tools for specific analyses of large databases through programming.
- Demonstrate a competency with data science practices that allows for reproducible results.
- Summarize findings based on complex analyses in a concise way for a general audience using multivariate graphics and statistical measures.

Course Materials and Technology

Textbook: There are three textbooks that we will reference throughout the course:
1. James, Gareth, et al. *An introduction to statistical learning: with applications in Python,* Version 2 (2023)
2. P. Bruce, A. Bruce, and P. Gedeck, *Practical Statistics for Data Scientists, 2nd edition*, Beijing: O'Reilly Media (2020)
3. The Py4DS Community, Python for Data Science, 2023.

All textbooks are available in PDF form or downloads from a link on the Blackboard course site. They are free and licensed for educational use via Creative Commons, or are acceptable via online library "lending" through Montgomery College.

Technology: We will use primarily Google Colab and other open source or free IDEs. Students must use their own non-Chromebook computer (Mac or PC is acceptable) and should have a Google account for use during the course

Additional Online Course Resources (Required and No Cost!)
1. Blackboard: Syllabus, handouts, links to practice resources, grades, and other course materials will be posted on the course Blackboard site. Blackboard will also be used for general course announcements.

2. Teams: An educational communications platform used by multiple institutions to support course discussions, Q&A, peer technical assistance, etc. Our DATA 201 classroom has been set up and the link is available on Blackboard.

Course Communications

In addition to a productive academic environment, active and consistent communication between instructors and students can positively influence learner success. **MC e-mail** is the official means of communication for Montgomery College. I will use **MC e-mail (via Blackboard Announcements)** and **Remind** messaging service for making announcements or communicating individually with you. I will provide individualized feedback on homework and presentations via your Teams personal channel. If you have a question about a specific assignment, it is best to communicate there. **Please do not use Blackboard messaging.**

Course Activities and Semester Grade Contributions

Course Coverage and Schedule: A summary course schedule is printed on the Quick Reference section of this syllabus. A full tentative schedule is posted below and on Blackboard. *The instructor reserves the right to alter the schedule of the course if necessary*. Any updates and weekly reminders will be communicated via Blackboard announcements.

Course Grades: The final grade is calculated according to the weights given in the Course Evaluation table on the Quick Reference section of this syllabus.

Course Grade Evaluation	
Participation	10%
Assignments	15%
Project 1 + Presentation	20%
Project 2 + Presentation	25%
Final Project and Presentations	30%

Participation: Three elements are combined to calculate this part of your grade.

Attendance – This is tracked on Blackboard. You receive full credit each time you show up on time to class – and stay for the entire class period. You will receive half credit if you leave early and/or if you will be more than 10 minutes late, and you send me a message explaining your delay **PRIOR** to the class start time. No credit is received if you are absent or more than 10 minutes late without notice.	**Engagement**. You have completed any reading or other preparation for class. You are taking notes during the lecture. Your laptop is open and you are following/running code in real time along with the demo. You make contributions or ask relevant questions in class and in online discussions. You avoid cell phone or unrelated laptop use during class.	**In-Class Activity** This class includes in-class active learning exercises and occasional "concept checks": short, low-stakes questions that you answer via online polling, Blackboard, or on paper. Participation always counts. Occasionally accuracy does, too. **There is NO MAKEUP if you are absent when we do an in-class activity.**

Assignments: Homework Labs and Online Discussion: You understood the class lecture and demo. Congratulations! Now it is important to practice what you learned and show that you have understood the concepts. Homework labs or discussions are assigned on Thursday are due at 11:59 p.m. on the following Tuesday. The labs are based on the in-class demonstrations/activities. The discussions will draw from the lectures, textbooks, or external readings or videos. **Late Assignments**: Late assignments will be accepted up to 3 calendar days after the deadline with a 10% penalty for each day after the deadline unless the student has communicated with the

instructor regarding the reasons for the delay and has made arrangements with the instructor for another submission date. *Attempts at the end of the term to submit any unsubmitted assignments, or to resubmit assignments with poor grades, will not be accepted.*

Projects: There are three projects that you must complete for this course. The deliverables for each project include a report (usually in the form of a Jupyter notebook) and a presentation. The requirements and rubrics for each project will be posted on Blackboard.

You are responsible for:

- Reading/reviewing all notes and all examples and trying all sample code
- Completing all assignments on time
- Practicing presenting speeches and other presentations
- If you miss class, it is your responsibility to find out what you missed and check Blackboard.

Extra Credit: Extra credit exercises may be given occasionally during the semester. ***However, no extra credit assignments will be given to make up for incomplete or late assignments that have not been submitted within one week of the due date. After Thanksgiving break, there will be no extra credit assignments.***

AI Policy for DATA 201: In this class, we recognize the value of each student's authentic voice. We also promote the critical thinking skills that emerge from developing your ideas in your own words. Generative artificial intelligence (AI) can be a helpful tool in a mathematics or data science class for organizing or summarizing materials for study and review, or to provide additional explanation and examples of a concept. AI can also be a useful coding support, recommending possible code or alternately helping to troubleshoot problematic code. AI can help to organize a presentation and suggest graphics or layouts that may enhance the presentation. **Those uses of AI are permitted in this class**. If you use AI in production of your code, presentation, or report, *you must include citations.* You may also provide an explanation of the code from the AI response, with a citation. **You may not use AI to produce unredacted and/or untested solutions for project code. You may not use AI to produce submissions or comments for discussion assignments. You may not use AI to produce unredacted and/or unattributed text for slides or project write-ups.** Written work for this class, whether calculations or text, must be completed by you personally for submission. Submission of calculations or text produced by generative AI without permission or without attribution will earn an automatic zero and will be considered a violation of academic ethics (Academic Regulations; Article 5.3).

Tentative Schedule

The instructor reserves the right to alter the schedule and topics, according to the progression of the class. Course materials (readings, lecture slides, labs) will be posted on the Blackboard. Any updates to the schedule will be posted on Blackboard.

Week	Date	Topics
1	Fe12	Course Overview, Intro to Colab, R to Python Fundamentals
2	Feb 19,	R to Python Data Analysis Bridge
3	Feb 26,	R to Python Data Analysis Bridge (cont.)
4	Mar 5	Model Form & Feature Selection: Diagnostics, Interactions, Nonlinearity
5	Mar 12	Model Form & Feature Selection: Transformations, Feature Selection, Interpretability vs. Stability
6	Mar 19	**Spring Break — No Class**
7	Mar 26	Extended Generalized Linear Models; Classification
8	Apr 2	Classification (cont.); **Project 1 + Presentations**
9	Apr 9	Resampling, Regularization, & Optimization
10	Apr 16	Neural Networks (Deep Learning 1)
11	Apr 23	Support Vector Machines
12	Apr 30	Tree-Based Methods (Decision Trees and Random Forests)

Week	Date	Topics
13	May 7	**Project 2 Presentations**; Distance-based & Clustering
14	May 14	**Final Project and Presentation (Final Exam Week)**

General Policies and Services

If you wish to withdraw from this class:

Please see me first and maybe I can help. But if we determine that withdrawal is the best option for you, then you must complete the appropriate process to make it official. It is your responsibility to drop the course. Non-attendance of classes or failure to pay does not constitute withdrawal. If you do not attend class and do not officially withdraw from the class, you may receive an F in this class. The last day to withdraw with a grade of W is 04/21/2026.

Expectations for Attendance and Participation:

Learning shouldn't be done in isolation; it is a social activity. Attend all class meetings and please be on time. This way you will avoid missing important information and also show respect for your peers.

Being present, active, and engaged in class will provide you with the deepest learning experience. To get the most out of this class, you will need to actively engage with the materials and resources.

Strong participation means having the assigned homework done (or attempted) on time and having ***questions*** if there are things you don't understand. It means being actively involved in discussions, ***asking questions***, and demonstrating that you read and have thought about the material. When not in class, study with classmates and in the learning center. Participation means demonstrating respect for others' ideas through acknowledging their views and asking for clarification when you aren't sure. Participation also means focusing on what is going on (being present), stepping up when you have a contribution and stepping back when it is time for others to talk. Whether you are outgoing or shy, everyone has something to contribute and together we will create a space for you to share.

Life happens and sometimes you may not be able to get to class. If you are encountering difficulties that cause you to miss a lot of classes, please reach out to me as soon as possible. *I might be able to help.* Otherwise, in cases involving excessive absences, I may drop you from the class. ***Excessive absence is defined as one more absence than the number of classes per weeks during a fall or spring semester – in our case this means 4 (four) absences***. Excessive absences can significantly decrease the likelihood that you will be successful in this class and it is not in your best interests to remain enrolled in a class where this is the case. If you decide to drop the class, **you** must submit a drop form to the registrar or you will receive an F.

Inclusivity and commitment to student success:

- Your well-being and success in this course matters to me.
- I will actively listen to you in this course, because your voice matters to me.
- I expect you to actively listen to me and each of your peers in our classroom.
- Your unique experience and background will be accepted in our classroom.
- I expect you to participate in this course without fear of making mistakes!
- I am committed to ensuring our classroom is an inclusive learning environment.
- It is my intent that every student is well served by this course, that the learning needs of every student is addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit within our classroom as well as in the broader community.
- It is my intent to present materials and activities in a safe space that are respectful of diversity: religion, gender, sexuality, psychological experience, ability/disability, age, socioeconomic status, ethnicity, race, language, immigration status, ideological perspectives, and culture. Your suggestions are encouraged and appreciated. Please share with me ways to improve the effectiveness of this course for you personally or for other students or student groups. In addition, if any of the assignment due dates conflict with your religious observances, please let me know so that we can make arrangements.
- I also acknowledge that here in Maryland, we are on stolen land belonging to the Pocomoke, Choptank, Accohannock, Assateague, Nanticoke, Susquehanna, Powhatan, and Piscataway Native American peoples.

Student Accessibility:

Any student who may need an accommodation due to a disability, please make an appointment to see me during my virtual office hour. In order to receive accommodations, a letter from Disability Support Services (DSS) will be needed. If you have not already done so, I encourage any student affected by a physical, psychological or learning disability to contact Disability Support Services (DSS) to determine if academic accommodations are appropriate. Please note that the DSS has strict confidentiality policies and that I am required (and happy) to make accommodations determined by DSS. The DSS new student intake process can be started here: https://www.montgomerycollege.edu/counseling-and-advising/disability-support-services/index.html

Learning Centers and Virtual Tutoring:

Montgomery College Learning Centers provide academic support resources, including virtual tutoring, to currently enrolled students. All students have access to the STEM Learning Centers, the Academic Success Center, and the Writing, Reading, and Language Centers. Information about specific learning centers and tutoring schedules can be found at

Learning Centers

Academic Regulations & Student Code of Conduct:

All MC students are expected to follow "Academic Regulations" & "Student Code of Conduct" as described in the MC Student Handbook. These regulations and guidelines can be found at Student Code of Conduct

Academic Honesty:

Honesty is the foundation of all good academic work. Students are expected to achieve their academic goals with honor, integrity and responsible behavior. Whether you are working on a homework assignment, quiz or exam, it is important that the work you submit be your own. Montgomery College professors are sincere in their desire to help you learn. Whether this is your first math class or your last math class, the purpose of pursuing a degree is to LEARN. Respect yourself, your classmates, and your faculty members by maintaining a high level of honesty throughout the entire

course. While we understand that this semester may present unique challenges, MC faculty are here to help you achieve your goals. If you find yourself in a position where you think that the only way to pass the course is to do so dishonestly, please reach out to your faculty member for support. The complete student code of conduct can be found at: Student Code of Conduct

Veteran's Services: If you are a veteran or on active or reserve status and you are interested in information regarding opportunities, programs and/or services, please visit the Combat2College Web site at http://www.montgomerycollege.edu/combat2college/

Technical Support:

- Montgomery College Website
- Hardware Specifications for Students
- IT Service Desk at 240-567-7222. Press 2 to reach the Blackboard Help Desk.
- Blackboard Technical Support Website

Inclement Weather and Emergencies: For the most up-to-date information regarding College openings, closings, or emergencies, all students, faculty, and staff are encouraged to sign up for email and text alerts via Montgomery College ALERT. Registration information is available at *www.montgomerycollege.edu/emergency*

Title IX:

- College Title IX Webpage
- Pregnant and Parenting Students
- Reporting Sexual Misconduct
- Sexual Misconduct Policy
- Transgender and Gender Nonconforming Resources

Student Support:

Your success as a learner also depends on having basic needs met. These include mental health resources, social supports, and adequate access to food. The following resources might be useful to you:

Student Service, Financial Assistance, And Resources
Student Health and Wellness Center for Success
Peer 2 Peer Program
Food Pantries and other Ways to Access Food and Essentials

Important Student Information Link:

In addition to course requirements and objectives that are in this syllabus, Montgomery College has information on its web site (see link below) to assist you in having a successful experience both inside and outside of the classroom. It is important that you read and understand this information. The ***link below provides*** *information and other resources to areas that pertain to the following: student behavior (student code of conduct), student e-mail, the tobacco free policy, withdraw and refund dates, disability support services, veteran services, how to access information on delayed openings and closings, how to register for the Montgomery College alert System, and finally, how closings and delays can impact*

your classes. If you have any questions, please bring them to your professor. As rules and regulations change they will be updated and you will be able to access them through the link. If any student would like a written copy of these policies and procedures, the professor would be happy to provide them. ***By registering for this class and staying in this class, you are indicating that you acknowledge and accept these policies.*** Syllabus Resource Link