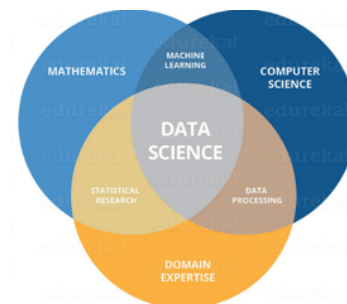












MONTGOMERY COLLEGE ROCKVILLE CAMPUS
DEPARTMENT OF MATHEMATICS AND STATISTICS
SYLLABUS –DATA 110 VISUALIZATION AND COMMUNICATION
Spring 2024 – M CRN 32213



Quick Reference

Contact Me 	Meet with Me 	Class Location, Days/Times, CRN 	Course Materials 	Important Dates 
Rebin Muhammad he/him/his rebin.muhammad@montgomerycollege.edu	MWF 10:30-11:30 HT 223 or Zoom link	W 6:00 pm - 8:40 pm Zoom link	All open source materials (see below)	No Grade Recorded/Change to Audit: Feb. 11th Withdrawal with a Grade of W: April 14th
Math Science Learning Center 	MC Virtual Tutoring Center 	Access-Ability 	Support Services 	Course Resources 
Ackerman Learning Center RV: SW 109 M, F: 9am – 4pm TWR: 9am – 7pm S: 9am – 3pm	Go Here	Disability Support Services (DSS)	<ul style="list-style-type: none"> • Student Services • Report Sexual Misconduct • Veterans 	<ul style="list-style-type: none"> • Runestone academy • MyMC Blackboard • MS Team

Zoom Course Link:

<https://montgomerycollege.zoom.us/j/97443101164?pwd=ZHILb1ZzN3NFL3M0NnNHbmFndWITQT09>

MS Team Link:

[Data 110-32213 | General | Microsoft Teams](#)

Communication: The best way to learn is not individually or in isolation, but within a community. We will use Blackboard for general purposes, but the main communication platform with me and your classmates is through a private discord channel that only students who take this class are allowed to join.

Course Description: Emphasis on communication skills for professional situations including effective quantitative summary and public speaking. Preparing and producing technical documents for specific audiences and analyses for general audiences.

Remote Learning Policy: This course **requires cameras for all classes.** Exceptions to this requirement might be made based on documented and legitimate personal situations (medical, family emergencies, and so on), legal exceptions (based on Title IX or American Disabilities Act), or evidence of technological disruption. Please communicate your situation and we can discuss options. **Continued reminders to turn on cameras will result in deductions in presentation grades.**

Prerequisite: A grade of C or better in MATH 117/117A/217, BSAD 210, or consent of department. Three hours each week.

Technology:



For our Data Visualization class, we'll be utilizing:

- **Python:** Essential for data manipulation and creating complex visualizations.
- **Tableau:** For crafting interactive dashboards that bring data to life.
- **GitHub:** To manage and share our visualization codes and projects.
- **Google Sheets:** For quick, collaborative data editing and simple visual tasks.

These tools are chosen to give you a broad exposure to the field of data visualization.

Textbooks:

For our Data Visualization course, the following texts will guide our learning:

- **Main Textbook:** "How to Think Like a Data Scientist," accessible on Runestone Academy, will be our core guide throughout the course.
- **Supplementary Text:** "[Data Visualization: A practical introduction](#)" by Claus O. Wilke, providing an extensive look at creating impactful data visualizations.
- **Additional Resource:** "[Data Exploration, Visualization, and Foundations of Unsupervised Learning](#)" by Wes McKinney, to further our understanding of data exploration and visualization within the Python ecosystem.

Course Outcomes

Upon course completion, a student will be able to:

- Construct oral and written arguments utilizing quantitative data.
- Express findings from scientific data analysis proficiently to a target audience.
- Apply techniques to develop and relate compelling stories with data.
- Compose and modify analytical summaries.
- Describe impression management strategies and situational communication preferences.

Course Requirements:

Homework: Please note that homework should be used for learning and studying purposes!!!

In order to be successful in this course, you will need to log on to the course site at minimum 4 – 5 times per week. While in the course site, you will access lecture notes, slides, podcasts, video clips, and other resources. In addition, the weekly assignments will include:

1. **Homework:** You will have homework assignments EVERY WEEK, including answering questions, preparing presentations, and writing assignments, and learning Python to create data visualizations. Because this is a 3-credit 15-week course, you should be prepared to spend a **minimum of 8-10 hours per week outside of class** working on homework and studying. If you do not make this commitment, your chance of success is greatly diminished.

I will check completed assignments every week.

2. **Written / Oral Presentations:** You will have individual and group presentations on a regular basis.
3. **Classwork:** You will learn to program with Python Software and various other software each week through the course notes.
4. **Projects:** There are 3 projects for this class. You will find real data to analyze using statistical techniques and present results to the class.

You are responsible for:

- Reading/reviewing all notes and all examples and trying all sample code
- Completing all homework assignments and submitting them in Blackboard Assignment Dropbox
- Practicing presenting speeches and other presentations
- If you miss class, it is your responsibility to find out what you missed and check Blackboard or MS Team.

Tips for success:

- Be an active participant during class time. Ask questions - during class or office hours, or by email. Ask me and your classmates.
- Give yourself plenty of time to prepare for speeches and projects.
- Do not procrastinate - don't let a unit go by with unanswered questions as it will just make the following unit's material even more difficult to follow.

Expectations on 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, which includes keeping your cameras on.

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.

In cases involving excessive absences from class, **I may drop you from the class**. Excessive absence is defined as one more absence than the number of classes per week during a fall or spring semester – in our case this means **2 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. I am aware that life happens. If you find yourself dealing with unforeseen issues that might cause you to miss a lot of classes, **please reach out to me as soon as possible. I might be able to help.**

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.

How your grade will be determined

My goal is to help all of you be successful in this class and I will do my best to support you. Ultimately, how well you do will depend on your own efforts. Your grade will be determined as follows:

Type of Activity	Percent	Weighted Average	Letter Grade
Homework	25%	90-100%	A
Class presentations/discussion posts	25%	80-89.999%	B
Project 1	20 %	70-79.999%	C
Final Project 2	30 %	60-69.999%	D
Total	100 %	Below 60%	F

Make-up Policy: Any individual issues must be brought directly to my attention.

E-mail Communication Statement: MC student e-mail is an official means of communication for Montgomery College. Students are responsible for information and announcements sent via MC e-mail, and it is expected that students check their student e-mail regularly. When e-mailing an instructor, it is expected that students use their MC student e-mail account. We will also heavily rely on our course MS Team channel for class discussions: **I will add all the students by myself same for Runeston.**

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:
www.montgomerycollege.edu/departments/academicevp/Student_PandP.htm

Math Science Center: You may receive help here from faculty or student tutors. You may also borrow a TI graphing calculator here for one day or for the entire semester. You should take advantage of this excellent resource center.

Rockville Campus, Judy Ackerman Learning Center (formerly the Math/Science Center) SW 109 240-567-5200, Please check for hours. <http://cms.montgomerycollege.edu/AckermanSTEMLearningCenter/>

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/>

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

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. <http://cms.montgomerycollege.edu/mcsyllabus/>*

Final Note: I am available during scheduled office hours and additional hours by appointment. I strongly recommend seeking help. I look forward to a successful semester with you.

DATA 110 Tentative Course Schedule *These dates are **approximate and subject to change**.*

Date	Topics
Week 1: Jan 22-28	Introductions – syllabus; Effective Communication and Documentation, google sheet, collecting data in class and visualize it.
Week 2: Jan 29-Feb 4	Google Colab and Python Basics: working on collecting data from pervious class.
Week 3: Feb 5-11	Data Import, Manipulation, and Visualization in Google Colab: A Deep Dive into the Happiness Dataset
Week 4: Feb 12-18	Optimizing Your Data Science Workflow: Integrating Anaconda, Jupyter, and Altair for Enhanced Python Analysis on the Movies Dataset
Week 5: Feb 19-25	Fundamentals of Pandas with the Movies Dataset
Week 6: Feb 26-March 3	Data Ethics - Responsible Practices and Principles in Data Analysis (and Visualization)
Week 7: March 4-10	Project 1
March 11-17	Spring Break – No classes
Week 8: March 18-24	Exploratory Analysis and Visualization: Enhance dataframe manipulation skills for deeper insights. Introduction to Altair for creating insightful data visualizations.
Week 9: March 25-31	Data Cleaning and Integration: Dive into data cleaning techniques for precise and reliable data. Explore the integration of external data through Web APIs.
Week 10: April 1-7	Transforming Data: data transformation with Pandas, emphasizing pivoting techniques. Analyze and present data from the CIA Factbook.
Week 11: April 8-14	Tableau
Week 12: April 15-21	Clustering and Dimension Reduction for Visual Storytelling: Explore clustering techniques to unravel patterns and narratives in data. Begin understanding and implementing dimension reduction for more concise and impactful visualizations.
Week 13: April 22-28	Techniques for Textual and Numerical Data; Begin working on final projects
Week 14 April 29-May 5	Continue working on final projects
Week 15: May 7th	Final projects and presentations 6:00 – 9 pm

By registering for this class and staying in this class, you are indicating that you acknowledge and accept these policies.