Data Visualization (Spring 2025, DATA 303)

Schedule
Monday, Wednesday and Friday 12:00PM to 12:50PM *ISC 2280*

Instructor
Heather Baier
hmbaier@wm.edu
ISC 1269
Office Hours: Tuesday 10:00AM to 12:00PM or by appointment (just email to set up!)

Please let me know if you have any documented disabilities that may impact your performance in this class.

Course Description: This course provides an overview of data visualization theory, helping students understand how to produce meaningful and interpretable figures from large sets of data. You will develop the capability to select between different approaches for visualization, and learn how to leverage visualizations to identify the best outcome for a given challenge. In addition to, this course provides students with the technical skills to produce their own visualizations using industry-standard tools.

Prerequisite(s): DATA 201, 146 or CSCI 146.
Credit Hours: 3

Materials:
A free SciClone account is needed in order to access the William and Mary High Performance Cluster (HPC). Registration can be started at https://hpc.wm.edu/acctreq/ .

You must bring a laptop to class each day unless otherwise noted during lecture.

There will be an online GitBook resource containing lectures and class materials at this link.

Grade Distribution:

Assignments (Best 3 of 4)	80%
Midterm Exam (or drop if all assignments completed)	20%
Final Project (Mandatory)	20%

Grading Policy:
There will be a total of 6 graded components throughout the semester:

- 4 Assignments
- 1 Midterm Exam
- 1 Final Project (Mandatory)

Students are required to complete the **Final Project**. For the remaining assessments, students may:

- Complete all assignments and the midterm exam, dropping the lowest grade, **or**
- Complete the final project and any 4 of the remaining 5 assessments (assignments or midterm).

Letter Grade Distribution:

>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	<= 59.99	F

.

Attendance: This class does not have an attendance policy. However, it will be difficult to learn enough to pass the class without regular participation, as the majority of course content relevant to the assignments will be covered in class.

Classroom Behavior: Please remain civil during discussions to promote the open exchange of ideas and foster a culture of open dialogue. Please bear in mind that all students are entitled to their own opinion. You are expected to listen attentively to each person speaking. Please refrain from eating during class (and, if you must, make sure it isn't loud!).

Late / Poor Performance Policy: Assignments will not be accepted late, excepting in documented circumstances (i.e., an illness with a doctor's note).

Piazza & Office Hours:
I will be providing support both in office hours (noted above), as well as digitally via Piazza. The signup link for piazza is at: https://piazza.com/wm/fall2023/apsc642 . Piazza is helpful if you would prefer to ask questions anonymously, and fellow students may respond more rapidly than I am able to.

Midterm and Final Project: An optional written midterm and required final project will test your knowledge of content presented during the course.

Important Dates: The add and drop deadline this semester is January 31, 2025, and withdrawal deadline is March 24, 2025.

Do not cheat!

Academic dishonesty is taken very seriously. Make sure to cite all of your work, and do not turn in work that is not yours! Cases of academic dishonesty will be evaluated and acted upon in accordance with William and Mary policies, which can be found at http://www.wm.edu/offices/deanofstudents/services/ student-conduct/

Course Outline:
The course outline can be found below. The weekly content might change as it depends on the progress of the class.

Monday (Theory)	**Wednesday (Application)**	**Friday (Application)**
	Jan 22 - Introduction and Syllabus	Jan 24 - Getting Started; Brief Review of Python
Jan 27 - Principles of Effective Visualization	Jan 29 - Data Viz in Python	Jan 31 - Data Viz in Python
Feb 3 - Principles of Effective Visualization (Cont.)	Feb 5 - Intro to Flask for Data Applications	Feb 7 - Flask for Data Applications
Feb 10 - Perception; Introducing Data Collection Assignment; Sketching with Data	Feb 12 - Flask for Data Applications	Feb 14 - Flask for Data Applications
Feb 17 - Sketching with Data; Humanism	Feb 19 - Flask for Data Applications	Feb 21 - Flask for Data Applications
Feb 24 - Summarizing Numerical Data: Histograms, Boxplots, and Subplots	Feb 26 - Flask for Data Applications	Feb 28 - Flask for Data Applications

Mar 3 - Summarizing Higher Dimensional Data; Introducing Project	Mar 5 - Qlik Sense: Introduction & Setup	Mar 7 - Qlik Sense
Spring Break: Mar 10 - Mar 14 (No Classes)		
Mar 17 - Dimensionality Reduction in Visualization	Mar 19 - Qlik Sense	Mar 21 - Qlik Sense
Mar 24 - Data Ethics and Visualization	Mar 26 - Tableau: Introduction	Mar 28 - Tableau
Mar 31 - Storytelling with Data	Apr 2 - Tableau	Apr 4 - Tableau
Apr 7 - Visualizing Uncertainty	Apr 9 - Power BI: Introduction & Setup	Apr 11 - Power BI
Apr 14 - User Experience in Visualization	Apr 16 - Power BI	Apr 18 - Power BI
Apr 21 - Final Project Integration (Multi-Tool)	Apr 23 - Final Project Workshop	Apr 25 - Final Project Workshop
Apr 28 - Course Review and Reflection	Apr 30 - Final Project Presentations (Part 1)	May 2 - Final Project Presentations (Part 2)