

Course Information

Course Title: Data Visualization and Web Analytics	Course Number: BUDT 758D
Days: Section 0501: Tuesdays and Thursdays at 5:00pm – 6:15pm in VMH 1212 Section 0502: Tuesdays and Thursdays at 5:00pm – 6:15pm in VMH 1212	
Term: Spring 2022	Credits: 3
Professor: Dr. Lauren Rhue	Pronouns: She/Her/Hers
ELMS/Canvas site address: https://umd.instructure.com/courses/1285961 Email: lrhue@umd.edu Office Location: 4324 Van Munching Hall (Decisions, Operations, and Information Technologies) Office Hours: Email for an appointment Course Dates: Course runs from January 24, 2022 – May 15, 2022	
TA: Maya Mudambi TA Email: mmudambi@umd.edu	

Course Description

This course is an introduction to data visualization techniques and web analytics. Data-driven decisions are increasingly embedded in business organizations, so professionals must be able to explore and communicate data with understandable and powerful visualizations. Furthermore, we cover the use of visualizations in web analytics.

Course Objectives

Upon completion of this course, you should be able to achieve the following learning objectives:

- Identify various data types (i.e., categorical, spatial, etc.) and know the appropriate visualization
- Create visualizations using Tableau software package
- Effectively communicate information to maximize readability and comprehension
- Explain social network analysis and the significance of network metrics
- Describe key performance indicators for web analytics

Course Structure

Following University policy, this Spring 2022 course is planned for in-person live sessions. If University policy should change, this website will be updated <https://umd.edu/4Maryland> and students will be

informed as soon as possible. The Maryland Smith community remains committed to providing you with the best learning opportunity while ensuring your continued health and safety.

This course will consist of lectures and hands-on lab sessions. Research has shown that individuals learn better by interacting and engaging with the material, and so the course is highly interactive. Prepare to complete visualizations during every session and engage with peers during class time. Detailed preparation instructions will be provided before each class session, so check the course site before every class. Those instructions supersede the course schedule in this syllabus.

Time Expectations

Each week, in addition to any scheduled class time, you should expect to spend about 3 hours outside of class, including reading the text, taking quizzes and/or completing learning activities. This time does not include exam preparation such as completing practice problems or studying. A sample work schedule is as follows:

Work Schedule

- **Class Time:** In-class activities and lectures
- **Outside of Class:** Complete assigned readings, assigned videos, and quizzes
- **Outside of Class:** Work on major assignments
- **Outside of Class:** Monitor email/ELMS for updates

Course Materials & Software

In this course, we will use different parts of multiple books. Two of these books are required, and the other two books are free in the digital format for Smith School students. Please use the links below to access the textbooks.

- **Book (Required):** Yau, N. (2013). Data Points. John Wiley & Sons. ISBN-10: 111846219X.
- **Book (Required):** Knaflic, C.N. (2015). Storytelling with Data: A Data Visualization Guide for Business Professionals. John Wiley & Sons. ISBN: 978-1-119-00225-3.
- **Book:** Kabacoff, R. (2020). Data Visualization with R. At: <https://rkabacoff.github.io/datavis/>.
- **Book:** Wexler, Steve; Shaffer, Jeffrey, and Cotgreave, Andy. The Big Book of Dashboards : Visualizing Your Data Using Real-World Business Scenarios. John Wiley & Sons, Incorporated. <https://ebookcentral.proquest.com/lib/umdcpr/reader.action?docID=4850323>. eBook ISBN: 9781119282785.
- **Book:** Clifton, Brian. Advanced Web Metrics with Google Analytics, John Wiley & Sons, Incorporated, 2012. ProQuest Ebook Central, . eBook ISBN: 9781118226445. <https://ebookcentral.proquest.com/lib/umdcpr/detail.action?docID=818125>

Software Requirements

Software Name	How to Access it
Tableau 10	<ol style="list-style-type: none"> 1. Download Tableau Desktop here (https://www.tableau.com/tft/activation) 2. Select each product download link to get started. When prompted, enter your school email address for Business E-mail and enter the name of your school for Organization. 3. Activate with your product key: TCLF-3A07-D090-11AC-BCCD
R	<ol style="list-style-type: none"> 1. Download R and RStudio
Google Analytics	Access Google Analytics through the online portal: https://marketingplatform.google.com/about/analytics/

Grading Structure

Your course grade comprises several different components.

Assignment	Percentage %	Points
Homework	25	250
Quizzes	20	200
Midterm Exam	20	200
Final Project	25	250
Participation	10	100
<i>Total</i>	100%	1000

Individual Assignments and Quizzes

- There will be five homework assignments for you to complete individually.
- All assignments and all quizzes are distributed and submitted through ELMS.
- Feel free to ask questions but only clarification questions will be answered.
- You will have unlimited attempts to complete the quizzes. The purpose of these quizzes is to make sure you understand the important points in the lecture and asynchronous material.

Midterm Exam

- The mid-term exam will be an open book, open notes exam.
- Details on the midterm exam will be distributed later in the semester.

Final Project

- Each student will create a Tableau story and use the principles of visualizations to tell a story.
- Details will be distributed later in the semester.

Professionalism

- **Peer reviews:** Complete all peer-reviews in a timely and constructive manner.
- **Participation:** Points will be allocated based on the quality and frequency of your contributions: e.g., producing meaningful, insightful, relevant and concise contributions; diligently working on

the classroom activities; helping and encouraging others; actively listening to others' presentations. Participation points will be awarded each week.

- If you have concerns, please contact me as soon as possible, preferably in the first week of the semester.

Grade Ranges

Typically, the following course grades are assigned using the following ranges: **A:** 95%+; **A-:** 90 - <95%; **B+:** 87% - <90%; **B:** 84% - <87%; **B-:** 80% - <84%. These grade ranges are guidelines to adjust your expectations, and there is flexibility in these ranges to account for class-level performance. The minimum requirement for a grade will only be adjusted downward, so the minimum threshold for a B+ might be lowered to 86% but it will not be raised to 88%.

Course Outline

Not all topics can be covered thoroughly in the discrete time blocks, so the class schedule is flexible and subject to change. The preparation, readings, and assignment due dates will always be announced in class and on ELMS. Check ELMS for the most up-to-date course schedule.

Week	Date	Tuesday	Date	Thursday	Due	
1	Jan 25	Course Introduction	Jan 27	Data, Chart Types & Excel		
2	Feb 1	Exploratory Data Analysis	Feb 3	Exploratory Data Analysis, cont.		
3	Feb 8	EDA wrap-up	Feb 10	EDA wrap-up, cont.	Q1	HW1
4	Feb 15	Introduction to R	Feb 17	Introduction to R, cont.	Q2	
5	Feb 22	Visualization in R	Feb 24	Visualization in R, cont.	Q3	
6	Mar 1	Introduction to Networks	Mar 3	Introduction to Networks, cont.	Q4	HW2
7	Mar 8	Web Analytics	Mar 10	Web Analytics, cont.	Q5	
8	Mar 15	Q&A	Mar 17	*Midterm Exam		
	Mar 22	<i>Spring Break</i>				
9	Mar 29	Introduction to Tableau	Mar 31	Introduction to Tableau, cont.	Q6	
10	Apr 5	Dynamic Tableau	Apr 7	Dynamic Tableau, cont.	Q7	HW3
11	Apr 12	Explanatory Analysis	Apr 14	Explanatory Analysis, cont.	Q8	
12	Apr 19	Tableau Stories	Apr 21	Tableau Stories, cont.	Q9	HW4
13	Apr 26	Visualization Best Practices	Apr 28	Visualization Best Practices, cont.	Q10	HW5
14	May 3	Advanced Tableau	May 5	Advanced Tableau, cont.		
15	May 10	Q&A, Course Wrap-up				
*Final Project due on Sunday May 15 at 11:55pm						

* Major Scheduled Graded Event

** H =Homework, Q = Quiz. Homework is due by 11:55pm on Friday, Quizzes due on Sunday at 11:55pm.

For Major Scheduled Graded Events (MSGEs), only University approved absences will be accepted (more details below). Make-up exams are at my discretion, and no extra time will be provided for late arrivals for exams.

Course Policies

Mask Policy

[University policy](#) requires that masks be worn over the nose and mouth while indoors at all times, regardless of vaccination status. There are no exceptions. Students must wear KN95 masks in the classroom. KN95 masks are available for free at the STAMP Union Building on Campus. Students not wearing a mask will be given a warning and asked to wear one, or will be asked to leave the classroom immediately. Students who have additional issues with the mask expectation after a first warning will be referred to the Office of Student Conduct for failure to comply with a directive of University officials.

Professionalism

All students are expected to act with professionalism during all class sessions and interactions with the professor, other students, and any guests. Professionalism covers your conduct in all class activities, homework review, and all class-related communications (e.g., emails with peers and instructor). All emails should be written with a subject and an introduction (e.g., "Dear Dr. Rhue"). Use proper spelling, correct grammar, and business-appropriate language (e.g., no slang or inappropriate emojis).

Class Discussions and Participation Guidelines

The primary goal of our discussions is to enhance the collective learning of the class. The following guidelines can help you make effective contributions to our class discussions. Please see the following list of tips for effective and meaningful discussion participation.

Examples of Good Discussion Contributions:

- Comments/questions that provide or seek clarification
- Comments that make points clearly
- Comments that move learning forward by building an argument and/or drawing on other comments without repeating
- Comments that respectfully articulate a point of agreement/disagreement

Examples of Ineffective Discussion Contributions:

- Destructive attacks
- Interrupting peers
- Monopolization of the discussion
- Disrespectfully articulating a point of agreement/disagreement
- Out-of-sequence comments / destroying the flow of class discussion

Recording and Online Privacy

In the event that we need to conduct class(es) online, our class sessions will all be recorded for use by enrolled students, including those who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are consenting to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are consenting to have their voices recorded. If you are not willing to consent to have your voice recorded

during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.

It is not necessary to have your camera on but in order to keep the class interactive you are welcome to:

- Keep both your video and audio on and contribute (mute is recommended if there is background noise)
- Keep just your audio on and contribute - stating your name first can help your classmates
- Use the chat box if you have contributions you'd like to be seen and read but don't feel comfortable sharing your own voice
- Ensure you're using the participation tools e.g. yes/no/hand-raise and participating in polls

Please reach out to me at any point if you feel you're falling behind or struggling to participate.

Office Hours

Office hours serve several different purposes, not just answering questions about the lecture and assignments. Office hours provide an opportunity to answer your questions about information systems in general, to discuss the course material in more depth, to tell me your career goals, and any other career-related topics.

Resources & Accommodations

Accessibility and Disability Services

The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The [Accessibility & Disability Service \(ADS\)](#) provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at **301-314-7682**, or adsfrontdesk@umd.edu. Information about [sharing your accommodations with instructors](#), [note taking assistance](#) and more is available from the [Counseling Center](#).

Student Resources and Services

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit tutoring.umd.edu to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpen their communication skills (and improving their grade) by visiting ter.ps/writing and schedule an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need (see go.umd.edu/assistance). If you feel it would be helpful to have someone to talk to, visit counseling.umd.edu or [one of the many other mental health resources on campus](#).

Basic Needs Security

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit go.umd.edu/basic-needs for information about resources the campus offers you and let me know if I can help in any way.

Statement on Diversity and Inclusion

As part of the [Smith School's commitment to diversity and inclusion](#), we recognize the importance of a diverse student body as necessary to a THRIVING environment. We are committed to fostering inclusive and equitable classroom environments. The Robert H. Smith School of Business strives to ensure all members of the Smith community feel welcomed, valued, and proud of every aspect of who they are. Through education, knowledge creation, advocacy, programming, and support, Maryland Smith commits to building an inclusive community that fosters a sense of belonging among all stakeholders.

I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Technology Policy

Please refrain from using cellphone and other electronic devices during class sessions unless we have designated such use as part of a class exercise.

Faculty Expectations

I would like to set expectations about what you as students can expect from the instructor. I will respond to emails within 48 hours, Monday - Friday. If you email me a question that I think will benefit everyone, I may ask you to post it on ELMS as the response. I will reserve questions sent to me in the 24 hours prior to the exam so I can share the answers with the class. Feedback on assignments and grades will be returned in a timely manner, targeting an interval of 5 business days from submission.

Student Expectations

While the following is not an exhaustive list and in no way can replace your grade in this class, the rubric below can assist you in clarifying how to be successful in this course. If you are concerned at any time that you are falling behind please contact me via email as soon as possible.

Unsatisfactory	Beginning	Developing	Excellent
Poor attendance	Mostly on-time attendance	Consistent, on-time attendance	Consistent, on-time attendance
Little or no meaningful contribution to class discussion	Occasional participation or contributions to class discussion	Frequent meaningful participation or contributions to class discussion	Consistent meaningful participation or contributions to class discussion
No or late submission of major assignments	On-time submission of all assignments	On-time submission of all assignments	On-time submission of all assignments
Minimal effort on assignments (inside and outside of class)	Demonstrated effort on some assignments	Demonstrated effort on most assignments	Demonstrated effort on all assignments
No high quality output on any learning assessment or subpar quality across several learning assessments	High quality output on some learning assessments	High quality output on most learning assessments	High quality output on all learning assessments
Disrespectful classroom etiquette	Respectful classroom etiquette	Respectful classroom etiquette	Respectful classroom etiquette

Attendance and Participation

- Given the interactive style of this class, participation will be crucial to learning and your performance in this class. Attendance is particularly important also because class discussion will be a critical component for your learning.
- Each student is expected to make substantive contributions to the learning experience, and attendance is expected for every session.
- Students with a legitimate reason to miss a live session should communicate in advance with the instructor, except in the case of an emergency.
- Students who miss a live session are responsible for learning what they miss from that session.
- Additionally, students must complete all readings and assignments in a timely manner in order to fully participate in class.

Absences and Late Policy

Late homework assignments require prior permission from the instructor and must be accompanied by a legitimate reason for not meeting a target deadline. Late assignments without permission will be penalized by 10% or a letter grade for each late 24-hour period, e.g., an assignment with a score of 15 will receive a score of 13.5 if it is 5 minutes late up to 24 hours late. Assignments that are more than 48 hours late will not be accepted.

[The complete university policy on absences can be found here.](#)

For Major Scheduled Graded Events (MSGEs), only University approved absences (e.g., religious observance, unforeseen life circumstances out of your control (with documentation), or documented illnesses with appropriate documentation) will be accepted. Make-up exams are at my discretion.

Grade Appeal

Submit the graded assignment with a written statement explaining your request for re-grading. Justify the appeal by referring to specific course material and/or the syllabus. If you appeal your grade, the entire assignment will be re-graded so the grade may increase or decrease. Appeals must be submitted within 7 days after a graded assignment has been returned. Grade appeals will be considered at my leisure and may take a long time to return.

Academic Integrity

The University's [Code of Academic Integrity](#) is designed to ensure that the principles of academic honesty and integrity are upheld. In accordance with this code, the Smith School does not tolerate academic dishonesty. Please ensure that you fully understand this code and its implications because all acts of academic dishonesty will be dealt with in accordance with the provisions of this code. All students are expected to adhere to this Code. It is your responsibility to read it and know what it says, so you can start your professional life on the right path. **As future professionals, your commitment to high ethical standards and honesty begins with your time at the Smith School.**

It is important to note that course assistance websites, such as CourseHero, are not permitted sources for Smith School courses [including this one](#). Material taken or copied from these sites can be deemed unauthorized material and a violation of academic integrity. These sites offer information that might not be accurate and that shortcut the learning process, particularly the critical thinking steps necessary for college-level assignments.






Additionally, it is understandable that students may use a variety of online or virtual forums for course-wide discussion (e.g., GroupME or WeChat). Collaboration in this way regarding concepts discussed in this course is permissible. However, collaboration on graded assignments is strictly prohibited unless otherwise stated. Examples of prohibited collaboration include: asking classmates for answers on quizzes or exams, asking for access codes to clicker polls, etc.

Finally, on each exam or assignment you must agree to and sign the following pledge:

"I pledge on my honor that I have not given or received any unauthorized assistance on this exam/assignment."

Please visit the [Office of Undergraduate Studies' full list of campus-wide policies](#) and follow up with me if you have questions.

To help you avoid unintentional violations, ***the following table*** lists levels of collaboration that are acceptable for each type of assignment. If you ever feel pressured to comply with someone else's academic integrity violation, please reach out to me straight away. Also, ***if you are ever unclear*** about acceptable levels of collaboration, ***please ask!***

	 Open Notes Students may look at their class notes while they complete this deliverable	 Use Book Students may look at the assigned course textbook/readings while they complete this deliverable	 Ask Friends Students may get help from classmates, friends, or others to complete this deliverable	 Search Online Students may search the web for related ideas or information while they complete this deliverable	 Work in Groups Students may complete the deliverable through joint work with others
Assignments	✓	✓	⊘	✓	⊘
Project	✓	✓	⊘	✓	⊘
Exams	✓	✓	⊘	⊘	⊘

Course Evaluation

Please submit a course evaluation through CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing through Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

For Prospective RAs

If you are interested in being an RA or intern, please feel free to send me email. It will eventually be reviewed; however, unfortunately, I cannot respond to every email. If you have a potential research collaboration in mind, please see the details on my website at <http://www.laurenhue.com/for-students>.

For Letters of Recommendation

I am delighted to serve as a letter-writer for outstanding students. “Outstanding” does not necessarily mean students who received an A. Make sure you have good attendance and participation in my class, treat me and other students with respect, and put forth a good effort on all assignments. Attending office hours at least once is a good way to ensure that I know you personally.

Academic integrity and professionalism are of the utmost importance to me and non-negotiable for me to write a letter. Please see the details given on my website at <http://www.laurenhue.com/for-students> for more on what I require as a letter-writer.

Easter Egg

Send an email to lrhue@umd.edu from your UMD email account with a picture of your favorite animal to confirm that you did indeed read and understand the information given in this entire syllabus. This picture is a nice icebreaker for me to learn a little about you.

Copyright Notice

Course materials are copyrighted and may not be reproduced for anything other than personal use without written permission.

About the Instructor

I am an Assistant Professor of Information Systems. I study the economic and social implications of technology because I believe in technology as a force for positive economic change. I enjoy data visualization because it is interesting and useful to learn to communicate information visually. Furthermore, interpreting visualization is a critical skill in today's graphic-heavy environment.