GEORGETOWN UNIVERSITY / McDONOUGH SCHOOL of BUSINESS

Programming I: Introduction to Data

Classes: Thursdays, August 29 – October 3

Semester/Year	Fall 2024/Mod 1
Professor	Babak Zafari
E-mail	babak.zafari@georgetown.edu TA: Sheeba Moghal (sm3924@georgetown.edu)
Schedule	Section 1 (HOYA): Tuesdays, 6:00pm to 7:20pm ET Section 2 (SAXA): Tuesdays, 8:00pm to 9:20pm ET
Office Hours	Dr. Zafari: Thursdays, 4:00 to 5:00 PM ET or by appointment Sheeba Moghal (TA): Saturdays, 1 to 2:30 PM ET Sheeba Moghal (TA): Mondays, 4 to 5:30 PM ET
Course Webpage	Canvas

Live Sessions (Thursdays)
August 29 - September 5 - September 12 - September 19 - September 26 - October 3

Course Description
This course teaches students how to implement business analytics in R. This course covers programming skills that will allow students to read in and organize data, present visually appealing summaries of the data and to analyze it.

Course Objectives

- Program in R, including data structures, loops and creation of functions.
- Read in, organize, and get to know the data
- Visualize data in a useful way.
- Implement linear regression models

Course Materials
There is no required textbook for this course. All required materials, including slides for all lectures, data files, or links to other resources will be posted on Canvas.

Software: You will be using R and RStudio in this course.

Course format and preparation for class: You are required to review the class recordings and read assigned materials before every live session. Live class sessions will consist of concepts, and practice work using. To be "active learners" and derive the most benefit from class discussions, please make sure to follow all assigned materials before every class. During live class sessions, please contribute to discussions and participate in hands-on work to familiarize yourself with the techniques and tools we study.

Canvas Website: There is a website for the course in Canvas containing required course content, including videos and interactive media, and other resources. Announcements, handouts, and additional resources will be posted. Please visit the site frequently and check for new course announcements and postings. It is your responsibility to keep up with all announcements made on the course website and take the appropriate actions.

Schedule

Pre-Course Work: 1. You should have RStudio set up on your computer as part of the course requirements for OPAN 6601 - Statistics Business Analytics.

	Live Session	**Topic**
Week 1	Thursday / Aug 29	1. Get set up in R and RStudio. 2. Load data 3. Three major data types: numeric, logical, and string 4. Four data structures: vectors, matrices, data frames, and lists 5. Descriptive statistics
Week 2	Thursday / Sep 5	1. Lists in R 2. Loops in R 3. If Statement 4. Functions 5. Combine loops and functions
Week 3	Thursday / Sep 12	1. Overview 2. The *tidyverse* package 3. The *dplyr* package 4. Piping functions in R 5. Join functions in R
Week 4	Thursday / Sep 19	1. Components of visualization 2. Base R for viz 3. ggplot2 4. Applications
Week 5	Thursday / Sep 26	1. Getting to know the dataset 2. Summarizing categorical data 3. Summarizing numerical data 4. Multivariate Analysis and Outlier detection 5. Hypothesis test
Week 6	Thursday / Oct 3	1. Simple linear regression 2. Understanding regression output and fit measures 3. Making predictions 4. Categorical predictors 5. Multiple regression

NOTE: All deliverable deadlines are adjusted on Canvas to 3 AM ET the following day the deadlines noted below:

Final exam period: Exam could be taken from October 11th to October 13th
Final project period: October 4th to October 18th
Details on final exam and the project will be released on Canvas.

Adhering to Policies: For the course to be effective and run smoothly, it is essential that you and I strictly follow these course policies. Therefore, please read them carefully and contact me if you have any questions or concerns. By taking this course you are agreeing to follow these policies. I will treat these policies as a contract and to be fair to everyone, will not grant any exceptions.

Grading Policy: The final grade will be on the following assignments (Check the last page for details):

- Assignments (individual) 40%
- Quizzes (individual) 15%
- Final Quiz (individual) 20%
- Final Project (learning group) 25%

Grades and Feedback on Assignments: Grades and feedbacks will be posted on Canvas.

Adhering to Policies: For the course to be effective and run smoothly, it is essential that you and I strictly follow these course policies. Therefore, please read them carefully and contact me if you have any questions or concerns. By taking this course you are agreeing to follow these policies. I will treat these policies as a contract and to be fair to everyone, will not grant any exceptions.

Policy on Grade Appeals: If you believe you have found a grading error in the assignments (unfortunately, they occasionally do happen), *please provide a written review request within 1 week of the original grade being distributed.* All assignment grades are considered final after the 1-week review period.

Attendance: Please come to class well prepared having read the assigned material and done the necessary analysis on the appropriate days. Empirical evidence shows that poor performance is strongly correlated with poor class attendance. Therefore, I strongly encourage you to attend all live classes. Please plan your travel and other activities around course deadlines. If you miss any class, it is your responsibility to let the instructor know and cover the missed class material on your own. Make sure you borrow a classmate's notes.

Assistance: It is your responsibility to keep up and utilize all help and resources available to you. If you find that you are falling behind or you feel that the course is difficult, do not hesitate to seek help. Come to my office hours and ask questions during class. If you cannot meet during the office hours, make an appointment for a mutually convenient time.

Live Session Classroom Etiquette, Ethics, and Georgetown University Honor Code: I expect from you the same level of professionalism, both in your approach to work and in the "products" you deliver, as your boss will. We expect all students to be live with their videos switched on, so the instructors speak with you instead of a blank canvas. Your effort to log-in on-time, not to chat, and not to engage in extraneous activities during class will be greatly appreciated.

You are expected to be familiar with the Georgetown University Honor System and the Honor code and are bound by requirements. As a faculty member, I am also obligated to report any suspicion related to violations of the Georgetown Honor System. For more details, please see http://honorcouncil.georgetown.edu/. Cheating and plagiarism will not be tolerated. In order to communicate expectations regarding group work vs. individual work, each assignment will be designated a type. Please consult the community standards document, which will indicate the guidelines for each assignment. Please ask me if you have any questions about this.

Students agree that by taking this course, the written project reports may be subject to submission to SafeAssign for the detection of plagiarism. SafeAssign compares the report with a huge pool of student papers and reports from Georgetown and a host of other institutions. All submissions may be added as source documents in the SafeAssign reference database solely for the purpose of detecting plagiarism of such papers in the future.

Finally, the syllabus cannot identify all possible solutions which represent honor code violations and is not meant to be comprehensive in this regard. Students are expected to abide by the intent and the letter of the honor code and are required to report any honor code violations that are observed.

For policies on all individual work, refer to the University and Academic Resources section of the MSBA Program page.

For group assignments (project deliverables), we will follow rules for collaboration from the Student Policies Document. For all deliverables, I restate the items below:

- Permitted with designated group, and expected that group members work together to complete the assignment
- Group submits one project/assignment
- Group members receive the same grade (except the peer-evaluation part which is based on the feedback received by team members or adjusted based on professor's review of the team's feedbacks)

Time Expectations: Our online classes are designed to meet the same academic standards as our place-based (face-to-face) courses. You can think of each module equal to the same level of participation, commitment, and academic rigor as a face-to-face class. Students should plan on spending approximately 8-10 hours per week on the work for each online module.

Max Mean Grade Policy: The course follows McDonough's graduate school policy of the maximum mean Grade Point Average (GPA) of 3.5.

Instructional Continuity: Please see Instructional Continuity section of the MSBA Student Syllabus Policies document. Deadlines for cases and homework submissions will not be affected by the university closure, unless otherwise notified.

Academic Accommodations: Please see Academic Accommodations section of the MSBA Student Syllabus Policies document.

Religious Observances: Please see Religious Observances section of the MSBA Student Syllabus Policies document.

Copyright of Course Materials: Please see Copyright of Course Materials section of the MSBA Student Syllabus Policies document.

Netiquette Guidelines

To promote the highest degree of education possible, we ask each student to respect the opinions and thoughts of other students and be courteous in the way that you choose to express yourself. Students should be respectful and considerate of all opinions.

In order for us to have meaningful discussions, we must try to genuinely understand what others are saying and be open-minded about others' opinions. If you want to persuade someone to see things differently, it is much more effective to do so in a polite, non-threatening way rather than to do so antagonistically. Everyone has insights to offer based on his/her experiences, and we can all learn from each other. Civility is essential.

Office of the Student Ombuds (OSO) - Confidential | Independent | Impartial | Informal
Students should consider contacting the Student Ombuds when they want to talk to someone about a university-related issue but don't know where to turn. The OSO is a confidential resource for undergraduate and graduate students. It's a safe setting for students to talk candidly about any University-related issues or concerns they may have. Some reasons for students to visit the office may be to address academic concerns, clarify administrative policies, discuss interpersonal conflicts, seek coaching to handle a sensitive situation, seek resources if they're experiencing harassment, bullying or other forms of intimidation, or if they want a place to safely express their frustration or concern.

Make an appointment with the Student Ombuds by writing studentombuds@georgetown.edu or calling 202-784-1081. The OSO is located in Room 207 of the Reiss Building (across from Arrupe Hall). More information is at studentombuds.georgetown.edu.

PROCTORIO

Proctorio is an online proctoring solution integrated in Canvas quizzes that offers identity verification, test monitoring, and a number of other features to ensure academic integrity. Throughout an exam, Proctorio will record the testing environment, and depending on the settings of the exam you may need to provide a scan of the room. Therefore, you should select private spaces for the exam session where disruptions are unlikely and where recording devices can be enabled. At the end of the exam, Proctorio generates an automated report for the instructor that flags any suspicious behavior, such as opening up new tabs on browsers, talking to others in the room, and looking away from the screen for too long.
To use Proctorio students are required to:

- Use a computer with a functioning webcam and microphone (no tablet computers or mobile devices)
- Use the Google Chrome browser or Microsoft Edge browser
- Install the Proctorio extension to the Google Chrome browser (students will complete this during a practice test)
- Have a reliable internet connection
- Use a quiet private location
- Have a GU photo ID ready to show (if the instructor requires it)

You will take a practice quiz using Proctorio to test your systems and help prepare for an actual test. 24/7 support is available for students by visiting Proctorio Support. See also Proctorio's How to Get Started page.

Please note: If you have challenges finding a computer that meets the technical requirements above, and/or concerns using an online proctoring tool, please contact your instructor who will work with you to find an equivalent alternative.

COURSE DELIVERABLES

NOTE: All deliverable deadlines are adjusted on Canvas to 3 AM ET the following day the deadlines noted below:

Assignments: 40%
There are four assignments for this course. Three of these assignments are a series of problem sets designed to help you build skill in R. In each lab, you will analyze a given data set, interpret the results, and answer several questions. The deadline for these assignments are posted on Canvas. They are graded on effort and completion. In addition, there is a discussion assignment posted on Canvas. Please allow a week for submission feedback.

Quizzes: 15%
There will be a total of six short quizzes for each module. These quizzes are mix of multiple choice and short answer questions. Each week's quiz will be released after the live session and will be due the following Sunday at midnight. In addition, there might be one or two discussion assignments posted on Canvas.

Comprehension Checks: 0%
Each week has its own comprehension check. These are designed to reinforce the learning goals of that week. The questions are not graded, and the solution will be provided right after submitting the answers.

Final Quiz: 20%
There will be a final quiz at the end of the semester. This quiz is comprehensive and will have a similar format to the weekly quizzes. This quiz will be moderated using Proctorio.

Final Project: 25%
Your final project is a ***shared project between two courses***: this course and OPAN 6601 – Statistics for Business Analytics. In the Final Project, you will apply the concepts, tools and techniques we study throughout this course and statistics and data analysis techniques learned in OPAN 6601. This will be ***group project*** based on pre-assigned study teams. The feedback of your group members about your performance in the team accounts for 20% of your grade for this project. The rest of the grade will be equally shared across the two courses, where each faculty will grade you for their tested discipline accordingly. The full project details will be posted on Canvas as a separate document.

Time Expectations:
Our online classes are designed to meet the same academic standards as our place-based (face-to-face) courses. You can think of each module equal to the same level of participation, commitment, and academic rigor as a face-to-face class. Students should plan on spending approximately 8-10 hours per week on the work for each online module.