**Materials covered in MTH 209**

I consider the following when determining what materials should be prioritized.

1. Basics. This reduces the knowledge gap between students who are from different backgrounds.
2. Conceptual materials, such as data types and data structures, since people can make mistakes due to not understanding them well, and can’t tell where the errors are or are not aware of errors.
3. Data Visualization Tools
4. Useful functions in tidyverse. Please don’t assume our students will be outstanding programmers. Tools in tidyverse are widely used in the industry and are part of essential knowledge in job interviews. These tools prepare students for industry expectations, as tidyverse is a standard in data analysis workflows, making this knowledge essential for career readiness.
5. Create maps since they are difficult for the students to learn by themselves in the future. By teaching map creation, students gain exposure to spatial data analysis, an increasingly important field in many disciplines, including environmental science, urban planning, and public health.
6. GitHub should be covered since most data scientists/analysts use it or a similar platform to create, store, and manage their code and share it with teams for collaboration. It's not just about coding; it's about working effectively in teams, managing project versions, and contributing to open-source communities. People from the School of Engineering, in particular, appreciate this and think it should be covered.
7. Other useful materials that the students may find helpful and should be able to pick up by themselves, even if we don’t have time to cover them.

Lesson 1: An Overview of R, RStudio, and R Markdown

Lesson 2: Basic Syntax and Data Types

Lesson 3: Basic Data Structures (Vectors, Matrices, and Arrays)

Lesson 4: Basic Data Structures (Lists, Data Frames, Factors and Tables)

Lesson 5: Installing R Packages & Reading Data Files

Lesson 6: Basic Graphical Displays

Lesson 7: Data Visualization with the R Package ggplot2

Lesson 8: Data Manipulation with the R Package tidyverse

Lesson 9: R Markdown Presentations

Lesson 10: Relational Data with dplyr

Lesson 11: Creating a Map Using ggplot2

Lesson 12: A Quick Overview of GitHub

**Below are optional materials, which may be used if time allows. (Lessons 13 & 14 should be covered, in my opinion.)**

Lesson 13: String Manipulation with stringr

Lesson 14: The apply() Family of Functions

Lesson 15: R Programming Structures

Lesson 16: Object-Oriented Programming