New Course Announcement
CSC100 Data Science for the World
CSC200 Introduction to Data Science in R

Credit Hours: 4
Lecture: MWF 10:30 – 11:20 AM, **Lab:** F 3:30 – 5:30 PM
Instructor: Mitsunori Ogihara (m.ogihara@miami.edu), Jerry Bonnell (j.bonnell@miami.edu)
Prerequisite: MTH108 or higher, or instructors' permission.

This new course offers an introduction to the concepts of data science and teaches basic data analysis skills using the programming language R and the R software package tidyverse.

Course Objectives The course offers an introduction to data science with R. The coursework consists of lectures, quizzes, weekly labs and assignments, and two exams (one midterm and one final). At the end of the course, students will be able to:

- Understand R programming fundamentals in the context of data
- Work with data frames and "tibbles", the core data structures for data analysis, and care for them with the tidyverse
- Produce data visualizations using ggplot2 and understand what is being represented
- Conduct statistical analyses of data to test hypotheses about the world, and draw meaningful scientific inferences from them
- Generate models about the world and make informed predictions using regression analysis and topic modeling

Topics Covered The topics covered in the course include, but are not limited to: data transformation, data visualization, simulation, sampling, empirical distributions, permutation testing, bootstrapping, normal distributions, regression analysis, tidy text, topic modeling.

Course Work and Grading Policy Midterm (10%), final (30%), homework (35%), quizzes (5%), and labs (20%). The labs and homework assignment are distributed as R Markdown files in RStudio for a live data analysis environment, and so students can intersperse code with prose. With a click of a button in RStudio, the homework is processed into a LaTeX PDF report which is graded on accuracy, and the labs are submitted online for immediate feedback so students can improve their results. Homework assignments are released on day of lab and due the following week before the next lab. Quizzes are low-stakes and take-home, to be completed before the next lecture and graded automatically for immediate feedback.

For CSC200 Students enrolled in CSC200 will additionally have a project based on a case study. The project will be given after Week 8 and then completed in two stages, Week 11 and Week 14. The grade breakdown for CSC200 students is midterm (8%), final (24%), homework (28%), quizzes (4%), labs (16%), and project (10% for part 1 and 10% for part 2, 20% total).