

Course: MA4500 Data Science and Social Justice

Periods per week: 4

Grade: 11 & 12

Credit: 0.5 or 1.0

Prerequisite: Algebra 2 (any level) or Algebra Topics & Technology

I. Learning Objectives

In this course students will:

- Use mathematics to make sense of our world
- Analyze social justice issues through the frame of data analysis
- Develop mathematical literacy of media
- Collect, organize and clean data
- Interpret models: Verify their accuracy and determine whether or not they are being used for the appropriate purposes
- Analyze the effectiveness of interventions into social justice issues
- Develop fluency with technology
 - R, R-studio, Python, Excel/Sheets, Tableau, google platform
- Explore whether variables are causal or correlational

II. Pedagogy

This course is:

- Project-Based: Each unit has a culminating or introductory project
- Taught using the Complex Instruction model: Students actively collaborate to develop their understandings
- Connected with the community: Students will work with community leaders to develop projects that are of interest to them
- Student centered: Students will determine which social justice issues they want to explore

III. Course Outline (A brief outline of the major topics and units which are central to this course; the sequence of topics and units may be altered by the teacher based on the needs of students):

1. Intro to Data Science/Data Cycle
2. Modeling and Statistical Sampling
3. Regression
4. Probability through Simulation
5. Categorical Data and Linear Programming
6. Prioritization Models and Biases
7. Machine Learning
8. Culminating Project

IV. Course Materials: In this course, teachers use materials and curriculum documents that have been specifically developed for this course.