# GEOG 592 – Geographic Information Systems Programming

## Spring Semester 2023

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**Class Time**; TR 11:00-12:15
**Location**: Carolina Hall 322
**Office Hour: TBA**

Course Description

GIS software is useful to help people in making maps, spatial analysis, and data processing. With the help of a little programming, it will become even more flexible and powerful.

Major objectives of this course: (1) Learning GIS programming languages such as Python, R and Google Earth-engine for customizing GIS applications, geo-processing, or implementing spatial models which could not be done through existing functions provided by software. (2) Promoting self-motivation in applying GIS programming knowledge to geographic researches, which can be either physical/environmental applications, or human/urban applications. (3) Integrating external GIS models (such as models coded in C++/Java) with GIS software through loose coupling. Students are encouraged to solve their research problems (thesis, dissertation, or other research topics) using GIS programming.

Students of this course should have prior knowledge and experiences of GIS software packages, such as ArcGIS through geog370, geog491, or working/projects. In the first ten weeks, students will learn python and R scripting, and also design a term project which needs significant amount of GIS programming - I would like students to implement geographic/spatial models using GIS programming, such as air pollution modeling, urban sprawl modeling, water quality modeling, or crime spatial simulation. Google Earth Engine scripting will be introduced in the last few weeks.