Geography 473, Summer 2022 University of Maryland College Park

**GIS and Spatial Analysis**

**Instructor**: Dr. Naijun Zhou, njzhou@umd.edu (NO ELMS messages)

**Online office hours**: 10am-12pm, Friday, Saturday, <https://umd.zoom.us/j/4850602035>

**Lectures & Labs**: Asynchronous. Videos will be posted on ELMS every week.

Each week, the Instructor will record the lecture **every Monday 9:30am-12pm**, record the lab **every Tuesday 9:30am-12pm**. You are welcome to attend them optionally.

(see Page 2 for classroom information)

# Course Objectives

GEOG473 will pick up what are left in GEOG373 (Introduction to GIS), and aim to provide the complete coverage of the GIS body of knowledge. GEOG373 introduces data models (vector, raster), projection, data collection, database (SQL), spatial analysis (geocoding, buffering, overlay, dissolve, classification), raster analysis, computer cartography, and the use of ArcGIS.

This advanced GIS course introduces the analytical use of geospatial information. Students will develop an understanding of spatial analysis methods, and learn practical skills of using GIS and spatial analysis to discover features of spatial distribution. The class covers the methods of spatial analysis including how to measure geometric features and identifying the spatial patterns of geospatial objects that are represented as point, line, network and polygon data.

As an important component of this class, labs are designed closely related to lectures and provide hands-on experiences of spatial analysis using ArcGIS Pro.

# Course Prerequisites

GEOG373 or equivalent. Under special circumstance, students willing to learn and catch up are acceptable even without any prior knowledge.

# Recommended Textbooks

There are no required textbooks. The following books may be useful for optional readings:

Andy Mitchell, 2005. *The ESRI Guide to GIS Analysis Volume 2: Spatial Measurements & Statistics*. ESRI Press. ISBN: 158948116X.

Paul Bolstad, 2005. *GIS Fundamentals: A First Text on Geographic Information Systems*, 2nd Edition. Eider Press, White Bear Lake, Minnesota, 2005. ISBN: 0971764719.

David O’Sullivan, David Unwin, 2003. *Geographic Information Analysis*, John Wiley & Sons.

Andy Mitchell, 1999. *The ESRI Guide to GIS Analysis Volume 1: Geographic Patterns & Relationships*. ESRI Press.

# Course Requirements

* **3 lectures**: point data analysis, line and network data analysis, area data analysis.
* **3 labs** grouped into the above 3 topics**.**
* **3 homework assignments**, each for one topic. Each homework includes findings from labs and lectures. A digital copy completed homework must be turned in on ELMS (details to be provided with homework questions).
* As summer courses are intensive, late work and make-up exams are given for University approved excused absences, and students must notify the Instructor and make arrangement at least 24 hours BEFORE the due date. Students need to provide valid documents for late work and make- ups. Otherwise, no late work and make-up requests will be accepted.
* Lecture slides, lab materials (instruction, data), announcements, homework assignments, archived lecture and lab videos will be posted on ELMS. Check ELMS frequently.
* **E-mail: for efficient communication, instead of ELMS messages, please email Dr. Naijun Zhou at** **njzhou@umd.edu.**
* **COMMUNICATE**! Feel free and do not hesitate to contact the instructor if you have any concerns, critiques and suggestions. They are ALWAYS welcome, and the earlier the better.

# Grading

My baseline grade for the course, which assumes that you complete the work in good faith, on time, with serious effort, and with a certain degree of success, is a "B." To do better, you need to give something extra, to do worse, you need to give something less. The numeric points of student’s work will be evaluated as:

|  |  |  |  |
| --- | --- | --- | --- |
| **Assignment Type** | **Number of Assignments** | **Points Per Assignment** | **Total Points** |
| Homework 1, 2, 3 | 3 | 30 | 90 |

The final letter grade is based on the percent converted from the numeric points in the above table, and will be graded as (with variations): A+: >98.0%, A: 90-98.0%, A-: 85.0-89.9%, B+: 80.0-84.9%, B: 75-79.9%, B-: 70-74.9%, C: 60.0-69.9%, D: 50.0-59.9%, F: <50.0%.

# Tentative Schedule

|  |  |  |
| --- | --- | --- |
| **Lecture (Recording Time)** | **Lab (Recording Time)** | **Homework Due** |
| **Date** | **Topic** | **Date** | **Lab** |
| 7/11 | Point Data Analysis | 7/12 | Lab 1: Point data analysis |  |
| 7/18 | Line Data Analysis | 7/19 | Lab 2: Line data analysis | Homework 1: 9AM, 7/18 |
| 7/25 | Polygon data analysis | 7/26 | Lab 4: Polygon data analysis | Homework 2: 9AM, 7/25 |
|  |  |  |  | Homework 3: 11:59PM, 7/30 |

**Online Learning**

1. The class format is asynchronous. But the instructor aims to provide synchronous learning experience for some interested students. Therefore, the **Instructor will host “synchronous” classroom 9:30am-12pm every Monday and Tuesday to record the lecture and lab for the corresponding week**.
2. The online classroom information is:

Join Zoom Meeting: <https://umd.zoom.us/j/96394130165?pwd=NWZEdkduTUliNFlFdnQ5MGZ3NDZHZz09>

Meeting ID: 963 9413 0165

Passcode: 736800

One tap mobile

 +13017158592,,96394130165# US (Washington DC)

 +16469313860,,96394130165# US

Dial by your location

 +1 301 715 8592 US (Washington DC)

 +1 646 931 3860 US

 +1 929 436 2866 US (New York)

 +1 312 626 6799 US (Chicago)

 +1 669 900 6833 US (San Jose)

 +1 253 215 8782 US (Tacoma)

 +1 346 248 7799 US (Houston)

 +1 669 444 9171 US

Meeting ID: 963 9413 0165

Find your local number: https://umd.zoom.us/u/adpr4VxGfM

1. During the lectures, the instructor will introduce the materials, and students can ask questions. During the labs, the instructor will demo the use of ArcGIS; students can follow the lab instruction to do the lab exercises and ask questions. The lectures and labs videos will be archived and available on ELMS.
2. **Hardware:** If you want to attend the optional synchronous lecture and lab, your computer must be equipped with **Internet** and **speaker** (or earphone).
3. **Software:** This course will use ArcGIS Pro through Geography Virtual Lab Environment. Visit <https://ter.ps/gsvdiwindoc> for Windows, and <https://ter.ps/gsvdimacdoc> for Mac about how to use the virtual lab and ArcGIS Pro.