**GISC 499 Internship Capstone Syllabus Spring 2023**

The GIS Certificate Capstone is intended to be the culmination of your undergraduate career in geospatial science. Some students fulfill the capstone through an Internship (499), while others do it as a Directed Study (491). In either case, as long as you work on your capstone with Dr. Gallagher or Dr. Bowen, the learning outcomes and the final products are the same.

**Office Hours:** Dr. Gallagher M&F 11-2 and TR 10:30-12. Dr. Bowen MWF 11-12 and T 10-12

**Dr. Gallagher - 540-654-1493; Dr. Bowen - 540-654-1491**

***Learning Outcomes:***

1. Gain practical experience in the application of GIS to a specific geographic problem/question/issue.
2. Be able to ask a geographic question, and develop an appropriate methodology for answering that question.
3. Write a report that explains to a non-GIS specialist the tools used to answer the geographic question.
4. Make a professional presentation, using slides, that demonstrates the methods and strategy employed to address the geographic issue.
5. Internship students will utilize their skills in a professional work place.

You need a project! Below, read about how capstone works for an internship.

Your project might involve data or a method you started in a previous course, that you expand on; it might involve an idea you have, or a suggestion from a professor, an internship, or a different (previous) research project. **This project will address a geographic issue, question or hypothesis.** You *must* do spatial analysis!

For 3 credits, you should expect to work about 9 hours a week, so ~130 hours over the semester.

You will participate in several meetings throughout the semester to ensure that you are on the right track and know what to do.

You will write a capstone paper, in which you will explain your geographic question or issue, describe the process and methods used, as well as the results and their significance. Write for an educated but non-GIS-specialist audience. You should include illustrations, for example your work-flow, tables and maps.

You will make a public presentation, which will also include illustrations through a slide-show, and again should be aimed at a non-GIS-specialist audience. A detailed description of the paper and presentation are provided within the assignments and in Canvas Pages.

***Evaluation:***

5% Meetings (4: weeks 3, 6, 9, 12 – more if you need!)
35% Internship supervisor evaluation
20% Presentation with slides, 9-11 minutes (week 15)
40% Written report (Friday Dec 9, last day of classes)

**Final grades** will be given using the following grading scheme:

Grading Scheme

| Percent | Grade | Percent | Grade |
|---|---|---|---|
| 93-100 % | A | 73-76.9 % | C |
| 90-92.9 % | A- | 70-72.9 % | C- |
| 87-89.9 % | B+ | 67-69.9 % | D+ |
| 83-86.9 % | B | 60-66.9 % | D |
| 80-82.9 % | B- | <59.9% | F |
| 77-79.9 % | C+ | | |

Mid-semester deficiency grades will be given for a grade below 70% based on graded material at that time.

## The Capstone Project via Internship

What makes this different from "any" internship is ***the completion and presentation of a single project, which must include some spatial analysis***. While at your internship, you will likely work on many different tasks; for the capstone you and your agency supervisor choose one of those and elevate it to the level of "project". Your project doesn't have to be about *everything* you have learned or achieved. You will work under the supervision of the agency, to the satisfaction of the agency supervisor, but your grade relies on more than the satisfaction of your agency supervisor. ***Unless spatial analysis is already part of the internship requirement, you may need to complete that part of the project independently, outside of the internship hours***.

Example 1: your supervisor asks you to digitize data to add it to a GIS, or to edit data to correct it in a GIS. There is no spatial analysis here, so you have to create some. Think about what you are digitizing or editing and write a "geographic question" which you will then test. E.g. where do I *expect* to see most [storm drains] – is this where they are? Are there more [trees] at high elevation or near streams – if so, why? What is the total (or average) length of road, or area of impermeable surface, or number of lampposts in this region – and why? In finding the answer to the question(s), you might buffer features, or create a heat map or use the field calculator or another tool to help you create a new map or a chart… you will almost always create at least one new map showing the analysis, helping you to answer the question.

Example 2: your internship requires that you write a script or develop a methodology (a tool) to automate a procedure (it might be altering the projection of hundreds of feature class layers, or scraping data from a series of web pages, or anything that is otherwise tedious!). Again, you ask a geographic question or test a geographic hypothesis to learn something about the data you are working with. Your project is then about the data created by your script, and your script is just one of the methods used in carrying out the project. You create one or more new maps or graphs that help you to accept or reject your hypothesis.

Example 3: your supervisor wants you to try some new method or app available from Esri, like dashboards or networking or asset management… you learn how it works and you take part of it to elevate into your capstone project. If the dashboard shows that energy use is highest in one part of the county at a certain time of day, you might explore potential reasons for that: is the number of households in that part of the county very high, or what types of industry occur here, or is the energy system very old and inefficient? You do spatial analysis using other types of data to address this one issue, and you create on or more new maps for your capstone project.

For the written capstone paper, you will describe the process and methods used, as well as the results and their significance, ***aimed at an educated but non-GIS-specialist audience***. You should include illustrations from each stage of your work, for example your work-flow, tables and maps. You'll make a public presentation, which will also include illustrations and again should be aimed at a non-GIS-specialist audience. A detailed description of the paper and presentation are below. You need to be able to explain why you are doing this project, and how you went about it, as well as how it worked.

While at the internship, some students may complete several projects; **for the capstone, choose ONE**. This may well be only a portion of your duties.

In order to assess all students equally, **projects cannot be classified**; if you are working with classified data, you will have to find some way to demonstrate your work using unclassified data and methods. ***Do not expect that you will be allowed to get clearance from your supervisor*** for me to look at your project: use different data instead.

***What constitutes a project?*** Something with a specific purpose (a geographic question, a geographic hypothesis), that has a beginning, middle and end. It needs to include some spatial analysis or procedure (location analysis, image classification, program written to complete a task, routing, spatial data analytics…) – if that is not part of the work for your internship, you need to do it independently. The project should be a substantial undertaking, but may not take up the entire 126 hours of the internship.

**Policies and Resources:**

1. **Covid-19 Statement:** As we begin spring semester of 2023, the number of cases of Covid-19 in our region is high, and other respiratory viruses are raging! This class will follow all UMW policies as they unfold. Above all, please pay attention to your own health. Do not go to any class if you are sick: email or phone your professor to advise them that you will be out. In the case of this class, please contact me if you are not well and cannot attend class. I do not want a synchronous online version of the class, but I can help you keep up and catch up after the fact. Of course, if I am sick, I will let you know!
2. **UMW's Honor Code:** As in every class and activity at Mary Washington, the Honor Code will be followed in this class. While I encourage each of you to offer help to your colleagues to solve problems and to seek such help as you study and work on your assignments, remember that any items you turn in to me individually must be your own work. Please pledge all assignments as you turn them in, e.g. "I did not give or receive unauthorized help on this assignment - your signature". Please do not discuss tests or quizzes with other students. Students should NEVER have identical sentences; beware of assuming that your peer 'knows' the answers! When writing your lab reports, include citations: anything beyond general knowledge should be cited.
3. **Office of Disability Resources:** The Office of Disability Resources has been designated by the university as the primary office to guide, counsel, and assist students with disabilities. If you receive services through the Office of Disability Resources and require accommodations for this class, please provide me a copy of your accommodation letter via email or during a meeting. I encourage you to follow-up with me about your accommodations and needs within this class. I will hold any

information you share with me in the strictest confidence unless you give me permission to do otherwise.

If you have not made contact with the Office of Disability Resources and have reasonable accommodation needs, their office is located in Seacobeck 005, phone number is (540) 654-1266 and email is odr@umw.edu. The office will require appropriate documentation of disability.

4. **Title IX:** University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence*. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. ***While you may talk to me, understand that as a "Responsible Employee" of the University, I MUST report to UMW's Title IX Coordinator what you share***. If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit http://diversity.umw.edu/title-ix/Links to an external site. to view UMW's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence* and to find further information on support and resources.

   Title IX Coordinator: Stefanie Lucas-Waverly, M.S.
   Fairfax House
   1301 College Ave.
   Fredericksburg, VA 22401
   Phone: 540-654-5656
   E-mail: slucaswa@umw.edu
   Website: http://diversity.umw.edu/title-ix/Links to an external site.

   **Confidential Resources**

   *On-Campus*

   Talley Center for Counseling Services: Lee Hall 106, 540-654-1053
   Student Health Center: Lee Hall 112, 540-654-1040

   *Off-Campus*

   Empowerhouse: 24-hr hotline: 540-373-9373
   Rappahannock Council Against Sexual Assault (RCASA): 24-hr hotline: 540-371-1666

5. **Recording Policy:** To ensure the free and open discussion of ideas, ***students may not record classroom lectures, discussions, and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use***. Students who wish to record lectures or class activities for study purposes must inform the faculty member first. Students with approved accommodations from the Office of Disability Resources permitting the recording of class meetings must present the accommodation letter to the instructor in advance of any recording being done. On any days when classes will be recorded, the instructor will notify all students in advance. Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded. Distribution without permission is a violation of educational privacy law. This policy is consistent with UMW's *Policy on Recording Class and Distribution of Course Materials*.