

GEOL 1901: Independent Study (4 credits): The independent study for the GIS & Remote Sensing Certificate is a major project intended to allow students to reinforce and polish their GIS and/or remote sensing skills. Students interested in projects primarily using GIS should register with Dr. Williams' section, whereas students interested in projects primarily using remote sensing should register with Prof. Ramsey's section. Students may either generate their own projects in consultation with their section advisor, or alternatively, if you are interested in another member of faculty's research, students are encouraged to reach out and work with them in their primary area of interest.

Each project should attempt to answer a particular question and should involve the integration of multiple GIS map layers and/or remote sensing datasets, and should use more advanced analysis techniques (e.g., Geostatistics, Spectral Analysis, Deep Learning etc.) to produce results. After defining the scope, students should plan on spending at least five hours each week working on the project and having regular weekly/biweekly meetings with their advisor. The purpose of these meetings is to ensure that adequate progress is being made and that the final product will meet the criteria of the capstone project. In addition to the capstone project, there may be scheduled group meetings at the discretion of your instructor. This will give students the opportunity to interact with others completing their GIS capstone projects. Sufficient work must be performed to earn four capstone credits. Projects must result in a presentation, report, or poster that describes the results of the research and the final result maps.

Each student should submit the following:

- A PowerPoint presentation, a 7- to 10-page paper, or a research poster that describes the goals of the project, the sources of data, the nature of the data analysis or manipulations, the results of your analysis (maps, satellite images, etc.), discussion of the significance of the results, and a summary of the conclusions of the study.

Other required documentation may include:

- Copies of the final GIS databases and/or RS images used to create your project; this is to allow someone else to later build on or modify what you did (if future needs make it necessary).
- Copies of all electronic files (for example the .aprx files in ArcGIS) that you used to generate the final maps. Again, this helps someone else pick up where you left off.
- A text file (.txt) containing all the metadata necessary to allow someone to reproduce your project. Once again, the goal is to make it easy for the end-user to easily modify your work if the need arises.

You should submit a copy of your project to your advisor by the last week of the semester (**before** finals week - speak to your advisor regarding deadlines). Make sure these files are clearly named and well organized in folders on your University OneDrive before sharing with your advisor.

To register for this class, you must obtain permission to register for four credits of GEOL 1901 from your chosen advisor. When emailing, please make sure to have listed the previously completed Certificate courses – you must have at least completed GEOL 1445 and/or GEOL 1460 to enroll, and it is recommended that you undertake this project after completing both core and elective courses (you can take electives concurrently with Independent Study). Following this, your advisor will contact either an academic advisor or departmental administrator to obtain a permission number allowing you to register. If you have questions regarding Independent Study, please reach out to Daniel Williams or Mike Ramsey.