Learning Objectives: To provide students who work with spatial environmental data the ability to apply the tools in geographic information systems to a wide variety of research, education, and communication objectives. These tools include the ability to build and edit spatial databases, create maps of spatial data, analyze data and derive spatial information, display spatial information effectively, construct and use models to examine spatial processes, develop a decision framework, and solve geospatial problems.

- Learn the fundamentals of GIS tools
- Apply the GIS to spatial environmental data. Develop communication skills using GIS.
- Construct spatial databases, create maps of spatial data.
- Analyze GIS data.
- Derive spatial information
- Display spatial information effectively.
- Construct and use models to examine spatial processes. Develop a decision framework.
- Solve problems.

Week 1  Introduction to Geographic Information Systems
Navigating ArcMap & ArcCatalog

Week 2  Online resources - ArcGIS Online, adding online data to Desktop
Coordinate systems – Geographic vs. projected systems, defining projections

Week 3  Displaying data – Data types, using symbols for raster and feature data
Displaying data – Classifying raster and feature data

Week 4  Displaying data - Labeling features, label placement, annotation
Presenting data – Templates, adding x-y data and graphics, page layout

Week 5  Creating features – Creating geodatabases, feature classes, fields and domains
Adding/editing features – Drawing and feature construction tools

Week 6  Editing features and attributes
Extracting Information – Querying attribute data, hyperlinks, reports

Week 7  Extracting Information – Joining and relating tables, geometry relations/functions
Creating features – Point features I

Week 8  Creating features – Point features II
Creating features – Polygons I (& lines)

Week 9  Creating features – Polygons II, using topology (i.e., relationship rules)
Analyzing feature relationships – Selecting features by location
Week 10    Data analysis – Dissolving, clipping, exporting  
             Data analysis – Buffering, overlaying, calculating attribute values

Week 11    Spatial Analyst & Modelbuilder  
             Creating raster surfaces – Georeferencing a raster file, rubbersheeting

Week 12    Draping images over surfaces, 3D visualizing, animation (3D Analyst)  
             ArcGlobe, Tracking Analyst

Week 13    More animation techniques  
             Creating rasters from point features (Geostatistical Analyst)

Week 14    Contouring, spatial autocorrelation, volume calculations (Geostatistical Analyst)  
             Converting raster data to features (ArcScan) and/or using Lidar data

**Grading:** Assignments will be given out during most classes, and they will test your knowledge of or extend that day’s topic. These assignments will be posted on the shared folder in MASIC and should be completed during the class they were assigned or during the following week.

Grades for the course will be based on these assignments. They will be graded on a scale of 0 to 3, with 0 for no record and 3 for completely accurate responses to the information requested. Grades (but not the assignments) will be posted in Blackboard, and it is your responsibility to check Blackboard periodically to make sure the grades were accurately recorded and to point out any errors. As such, it will help to keep graded assignments as a record of your work.

**Disability Support Services (DSS):** If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services (631) 632-6748 or http://studentaffairs.stonybrook.edu/dss/. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website:  http://www.stonybrook.edu/ehs/fire/disabilities

**Academic Integrity:** Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at  http://www.stonybrook.edu/uaa/academicjudiciary/