

## **GIS CERTIFICATE PROGRAM COURSE DESCRIPTIONS**

### **GIS 100 Fundamentals of Geographic Information Systems (GIS)**

This course is an introduction to geographic information systems (GIS), including its development, components, data types, formats, and applications. It examines the processes involved in order to capture data, manipulate data, analyze data sets, and display spatial data through online lectures and classroom hands-on computer experience. The use of GIS for practical “real-world” applications is emphasized. Students will be afforded the opportunity to learn about the broad applications of GIS, appreciate the usefulness of it, and use it as an invaluable tool to visualize spatial patterns not otherwise visible. *May be required as a prerequisite course; hybrid format consisting of an evening class session on campus every other week with the balance of coursework delivered via an online format.*

### **GIS 200 Remote Sensing and the Global Positioning System (GPS)**

Remote sensing is the science of deriving information about the earth's land and water areas from images acquired at a distance. It usually relies upon measurement of electromagnetic energy reflected or emitted from the features of interest. Advances in detector technology, the public availability of improved datasets from new instruments, and new approaches to data analysis will be presented in this course. As such, the ability to work with and interpret remote sensing data is a valuable addition to any spatial project. The emphasis in this class will be on traditional remote sensing techniques such as aerial photography and satellite imagery. However, an introduction to uses of radar, microwave, gamma ray, and neutron remote sensing techniques will also be provided. Explanation of, and practical applications of the global positioning system (GPS) are also covered. *Online format only.*

### **GIS 300 Capstone Course**

Utilizing knowledge from the previous courses, this course will expand upon spatial analyses and include applications for GIS. Students will gather data, build a database, and construct a project including an analysis of the information gathered to solve a practical problem. Projects will be presented and stored in the form of an electronic portfolio. Emphasis centers on hands-on training and solving practical spatial problems. *Online format only.*

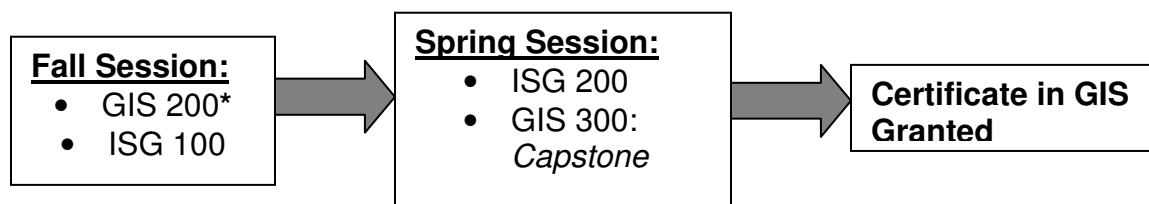
### **ISG 100 GIS Programming with ArcObjects**

This course will introduce the student to Visual Basic for Applications (VBA) programming. It is oriented toward Geographical Information Systems (GIS) applications. The course initially covers essential object oriented programming (OOP) concepts such as the use of objects, properties, methods and events; how to set and use variables; how to write procedures and link them to the user interface; how to program using sequence, selection and repetition structures. Next, the basics of using ArcObjects are discussed, including the ArcObjects architecture, how to read object model diagrams, and how to use programming interfaces. Finally, an introduction to the Python programming language and its use in geoprocessing scripts is given. *Online format only.*

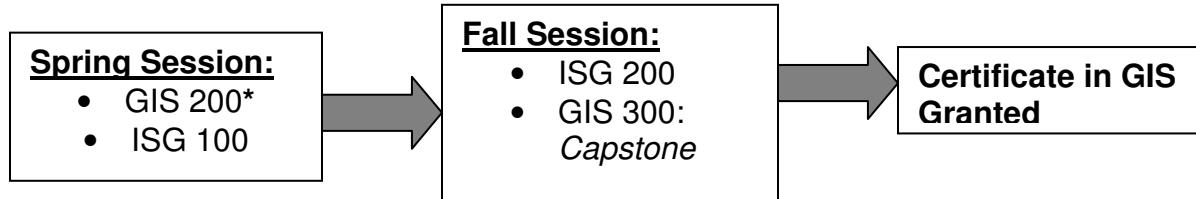
## ISG 200 Implementing Geodatabases

This course will give the student an in-depth look into design and development of a Microsoft Access database. The course initially covers essential relational database theory and normalization. A comprehensive presentation of Structured Query Language (SQL), a computer industry-standard syntax language for querying and manipulating a relational database, is then provided. Next, the geodatabase model is presented including feature classes and datasets, relationship classes, and topology. A number of pertinent case studies are presented. Finally, the student will experience hands-on designing, building, and efficient use of geodatabases. *Online format only.*

### GIS Certificate Program Course Sequence *FALL Cohorts:*



### GIS Certificate Program Course Sequence *SPRING Cohorts:*



\* **Note:** Successful completion of **GIS 100, Introduction to Geographic Information Systems**, may be required as a prerequisite to the GIS 200 based upon student's previous academic/professional experience.

