



COURSE OUTLINE

GIS426

Prepared: Heath Bishop Approved: Corey Meunier

Course Code: Title	GIS426: INTRODUCTION TO ARC GIS
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semester/Term:	17F
Course Description:	As a foundational course in the program, this course provides much more than just an introduction to GIS theory and concepts. Through hands-on application of industry leading ArcGIS software, students will learn how the various components of the software can be used together to solve complex spatial problems. Specific attention will be paid to the following topics: the ArcGIS interface, data management and geoprocessing, presenting data, manipulating, editing and creating data, attribute and spatial queries, raster analysis and coordinate systems.
Total Credits:	5
Hours/Week:	5
Total Hours:	75
This course is a pre-requisite for:	GIS412, GIS423, GIS427, GIS440
Vocational Learning Outcomes (VLO's): Please refer to program web page for a complete listing of program outcomes where applicable.	<p>#1. Understand the general concepts of spatial information and the current methodologies used to input, store, manipulate, and retrieve this type of data in a computer based environment;</p> <p>#2. Understand the typical data structures, algorithms, and computational problems that are encountered in various GIS technologies;</p> <p>#3. Be aware of the variety of sources of spatial data, such as surveying and remote sensing, that feed into a GIS, and the methods by which these data are realized in a GIS system;</p> <p>#4. Understand the ways in which GIS technologies can be applied within specific disciplines (see assumption above), and the advantages, changes in method, developmental problems, and restructuring that may result from the adoption of these technologies;</p> <p>#6. Be aware of the issues surrounding the communication of data extracted from a GIS to a variety of potential end users;</p> <p>#7. Be capable of generating a plan for the design, implementation, and operation of a proposed GIS systems for a typical industrial client or group, and executing this plan as a demonstration project.</p>
Essential Employability	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that



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Skills (EES): fulfills the purpose and meets the needs of the audience.
 #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
 #3. Execute mathematical operations accurately.
 #4. Apply a systematic approach to solve problems.
 #5. Use a variety of thinking skills to anticipate and solve problems.
 #6. Locate, select, organize, and document information using appropriate technology and information systems.
 #7. Analyze, evaluate, and apply relevant information from a variety of sources.
 #10. Manage the use of time and other resources to complete projects.
 #11. Take responsibility for ones own actions, decisions, and consequences.

Course Evaluation: Passing Grade: 50%, D

Other Course Evaluation & Assessment Requirements: In addition to a passing grade in the course overall, students must also achieve an average mark of at least 50% on the test components in order to pass the course.

Grade
 Definition Grade Point Equivalent
 A+ 90 – 100% 4.00
 A 80 – 89%
 B 70 - 79% 3.00
 C 60 - 69% 2.00
 D 50 – 59% 1.00
 F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.
 S Satisfactory achievement in field /clinical placement or non-graded subject area.
 U Unsatisfactory achievement in field/clinical placement or non-graded subject area.
 X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
 NR Grade not reported to Registrar’s office.
 W Student has withdrawn from the course without academic penalty.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	45%
Quizzes	5%
Tests	50%



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Books and Required Resources:

Mastering ArcGIS by Maribeth Price
Publisher: McGraw-Hill Education Edition: 7
ISBN: 9780078095146

Course Outcomes and Learning Objectives:

Course Outcome 1.

1. Identify and demonstrate proper storage and organization of GIS data files and folders.

Learning Objectives 1.

- 1.1 Demonstrate proper folder and file naming conventions.
- 1.2 Organize various GIS project data using relative and absolute paths.
- 1.3 Identify the importance of file management when working with GIS data.

Course Outcome 2.

2. Explain the foundational concepts of coordinate systems and be able to assign them and troubleshoot coordinate system issues.

Learning Objectives 2.

- 2.1 Explain datums, projections and coordinate systems.
- 2.2 Explain and utilize the Project and Define Projection tools in ArcGIS, as well as apply 'On-the-fly' projection.
- 2.3 appropriate projections to use based on specific maps and datasets being used.

Course Outcome 3.

3. Demonstrate the ability to query, relate, tabularly join and spatially join GIS data.

Learning Objectives 3.

- 3.1 Explain the concepts and importance of tabular joins while also being able to perform these joins using ArcGIS software.



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- 3.2 Use proper SQL syntax to query spatial and aspatial data.
- 3.3 Identify when and which spatial joins are appropriate to use in analysis and be able to perform these joins in a software environment.
- 3.4 Identify when relates are appropriate to use in analysis and be able to perform these relates in a software environment

Course Outcome 4.

- 4. Identify the uses of various geoprocessing tools and demonstrate the ability to use them in combination to solve geospatial problems, including through the use of Modelbuilder.

Learning Objectives 4.

- 4.1 Explain and utilize numerous geoprocessing tools available in ArcToolbox.
- 4.2 Identify the appropriate property settings for geoprocessing tools.
- 4.3 Develop problem solving skills and apply those skills through the use of these tools.
- 4.4 Utilize Modelbuilder to automate geospatial processes.

Course Outcome 5.

- 5. Identify and apply proper cartographic standards necessary for communicating information through the medium of maps and map layouts.

Learning Objectives 5.

- 5.1 Apply appropriate cartographic design through following industry-wide standards.
- 5.2 Demonstrate appropriate space, colour and balance to maps in an aesthetically pleasing way.
- 5.3 Identify and utilize proper symbology, labelling and annotation to effectively communicate map information.

Course Outcome 6.

- 6. Demonstrate the ability to create new spatial and attribute data and modify existing data.



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Learning Objectives 6.

- 6.1 Use editing tools to modify and improve existing spatial data.
- 6.2 Populate spatial data attributes using the editing functions in ArcGIS.
- 6.3 Explain the importance of ensuring quality data and identify editing tools that can be used to ensure a high quality level.

Course Outcome 7.

- 7. Explain the basic fundamentals of raster data and utilize raster files to solve geospatial problems.

Learning Objectives 7.

- 7.1 Identify key concepts regarding raster file formats including issues surrounding cell size, map algebra and other raster tools and processes.
- 7.2 Utilize rasters and spatial analyst tools to solve spatial problems.

Date:

Friday, September 15, 2017

Please refer to the course outline addendum on the Learning Management System for further information.