COURSE OUTLINE: GIS427 - GIS APPLICATIONS

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Course Code: Title	GIS427: GIS APPLICATIONS
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semesters/Terms:	19W
Course Description:	This course builds upon the students previously developed abilities in ArcGIS. The primary component of the course focuses on applying the students knowledge to everyday projects that are performed in the work world. Through undertaking these types of projects, the students gain an understanding of not only how to use the software extensions, but also howthey can be applied in an everyday work setting in various fields. Course work continue to develop problem solving skills through the use of geodatabase functionality, Modelbuilder, Spatial Analyst, Network Analyst and geocoding.
Total Credits:	5
Hours/Week:	5
Total Hours:	60
Prerequisites:	GIS426
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: Please refer to program web page for a complete listing of program outcomes where applicable.	**4018 - GIS-APPLICATION SPEC** VLO 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; VLO 2 Understand the typical data structures, algorithms, and computational problems that are encountered in various GIS technologies; VLO 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; VLO 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; VLO 6 Be aware of the issues surrounding the communication of data extracted from a GIS to a variety of potential end users; VLO 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.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.

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	EES 3 Execute mathematical operations accurately.
	EES 4 Apply a systematic approach to solve problems.
	EES 5 Use a variety of thinking skills to anticipate and solve problems.
	EES 6 Locate, select, organize, and document information using appropriate technology and information systems.
	EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
	EES 10 Manage the use of time and other resources to complete projects.
	EES 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.
Books and Required Resources:	Mastering ArcGIS by Maribeth Price Publisher: McGraw Hill Education Edition: 8 ISBN: 9781260092486

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Develop geodatabases and utilize their extended functionality.	1.1 Explain the importance of geodatabases and how they differ from other file formats. 1.2 Create geodatabase planar topology rules and identify when to use the rules to ensure data integrity. 1.3 Administer subtypes and domains within a geodatabase. 1.4 Identify the importance and application of a geodatabase schema.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Utilize spatial analyst tools to perform raster based analyses.	2.1 Access and use the ArcGIS spatial analyst extension. 2.2 Describe the sources, formats, data types and structures of raster GIS data. 2.3 Describe potential raster GIS analyses. 2.4 Use Map Algebra to perform complex spatial analyses. 2.5 Utilize surface hydrology tools to aid in stream delineation.

Course Outcome 3	Learning Objectives for Course Outcome 3
3. Utilize the 3d analyst extension to perform 3-dimensional analysis.	3.1 Access and use the ArcGIS 3d analyst extension. 3.2 Describe TIN and terrain data structures, data sources and surface concepts. 3.3 Perform slope, aspect, analytical hillshading, visibility and surface profiling analyses. 3.4 Perform 3-D surface area and volumetric analyses.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Utilize the network analyst extension to perform analysis.	4.1 Demonstrate the ability to create network datasets. 4.2 Utilize network datasets in order to perform problem solving routines such as determining fastest routes, identify service areas, etc. 4.3 Describe network analysis theory and concepts.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Demonstrate the ability to create address locators and perform associated geocoding processes.	5.1 Explain the concepts of geocoding and the different types of address locators. 5.2 Create address locators using primary, alias and alternate name tables. 5.3 Perform address re-matching as part of the geocoding process.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6.Explain and apply various ways in which GIS is applied in the health sector.	6.1 Describe scenarios in which GIS is an appropriate tool to be used in the health sector. 6.2 Utilize Microsoft Excel to prepare health data for use in GIS. 6.3 Identify how census data can be used in combination with health data to perform various types of analyses.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Use Modelbuilder to create and manipulate models to achieve automated processes in a GIS environment.	7.1 Explain the basic concepts of ArcGIS Modelbuilder. 7.2 Identify the appropriate scenarios in which models should be used in geoprocessing procedures. 7.3 Successfully create and run iterators within a model.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Assignments	45%	1-7
Quizzes	5%	1-7
Tests	50%	1-7

Date: August 22, 2018

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