Prepared: Chuck Shannon/Heath Bishop Approved: Corey Meunier

Course Code: Title	GIS428: ADVANCED PROGRAMMING FOR GIS
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semester/Term:	18W
Course Description:	The power of Geographic Information Systems lays in the automation of repetitive and complex GIS operations to save time, produce consistent results and present clients with usable GIS products and interfaces. Upon successful completion of this course the student will have developed useful Python programming skills which can be applied to the field of GIS and beyond.
Total Credits:	2
Hours/Week:	2
Total Hours:	24
Prerequisites:	GIS401
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4018 - GIS-APPLICATION SPEC** #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; #2. Understand the typical data structures, algorithms, and computational problems that are encountered in various GIS technologies; #5. Be capable of designing and executing, in a progressive manner, algorithms and programs to handle spatial data and associated hardware devices in a programmatic environment of a GIS; #6. Be aware of the issues surrounding the communication of data extracted from a GIS to a variety of potential end users;
Essential Employability Skills (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. #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:	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 / 20% Labs / 20% Tests / 60%
Course Outcomes and Learning Objectives:	**Course Outcome 1.** 1. Describe key programming concepts. **Learning Objectives 1.** 1.1 Apply appropriate coding standards. 1.2 Describe the concept of what Objects are and how we define them in application development. 1.3 Differentiate between properties, methods and events. **Course Outcome 2.** 2. Develop ArcMap Add-Ins to expand the functionality of the applications. **Learning Objectives 2.** 2.1 Demonstrate how using VB.Net 2010 and ArcObjects we can build new functionality into the ArcGIS suite of applications. 2.2 Recognize the different type of components we can develop such as command buttons and toolbars.

	Course Outcome 3. 3. Demonstrate the ability to code using the Python Scripting Language. **Learning Objectives 3.** 3.1 Investigate the Python language syntax. 3.2 Identify the differences between Python and VB.Net. 3.3 Utilize Python with ArcMap using its own ArcPy Editor. 3.4 Utilize Python with PythonWin development environment. **Course Outcome 4.** 4. Demonstrate how to use ArcPy library for Python to extend ArcGIS functionality. **Learning Objectives 4.** 4.1 Demonstrate the use of ArcPy to simplify Geoprocessing tasks. 4.2 Demonstrate how to use built in tools with ArcPy. 4.3 Practice using spatial data with ArcPy. 4.4 Practice manipulating spatial data with ArcPy. 4.5 Build Add-Ins using ArcPy.
Date:	Friday, January 19, 2018
	Please refer to the course outline addendum on the Learning Management System for further information.