COURSE OUTLINE: GIS431 - ADVANCED REMOTE SEN

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Course Code: Title	GIS431: ADVANCED REMOTE SENSING
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semesters/Terms:	19W
Course Description:	The field of remote sensing is rapidly advancing and includes numerous ways in which to collect and analyze spatial information. This course builds upon the Introduction to Remote Sensing course by going beyond optical collection methods and including such data sources as LIDAR, RADAR, Thermal and SONAR data. In addition to these methods, some unique optical data sources such as Drone imagery and others are included as well. This course complements and builds upon the Introduction to Remote Sensing course by expanding student exposure to a variety of remote sensing methods and processes.
Total Credits:	3
Hours/Week:	3
Total Hours:	36
Prerequisites:	GIS422
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 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;
Essential Employability Skills (EES) addressed in this course:	EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. 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.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Identify LIDAR data sources and be able to interpret and analyze LIDAR data.	1.1 Describe, load, manage and interpret LIDAR data. 1.2 Explain LIDAR returns and create Bare Earth models using appropriate software.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Demonstrate the ability to georeference and mosaic remotely sensed imagery.	2.1 Effectively collect Ground Control Points and cutlines. 2.2 Create seamlessly mosaiced aerial images.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Recognize ways in which Thermal data can be used in real-world scenarios.	3.1 Load, manipulate and create value added products using Thermal imagery. 3.2 Research examples as to how thermal data is used in conjunction with other spatial data in order to solve problems.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Identify RADAR imagery as a means to collect information from the Earth`s surface.	4.1 Evaluate how RADAR technology can be used to identify and differentiate between features on the Earth`s surface. 4.2 Recognize when RADAR imagery is an appropriate type of technology to use dependent on the problem at hand.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Use Google Earth as an effective tool to assist with various geospatial solutions.	5.1 Identify the variety of tools and functions available within the Google Earth Pro software. 5.2 Create and save KML/KMZ files in a way that they can be

	distributed to, and used by, other users.

Course Outcome 6	Learning Objectives for Course Outcome 6
6. Demonstrate the ability to use PCI Modeler to effectively automate repetitive geospatial processes.	6.1 Identify the methods and steps used to create Modeler workflows. 6.2 Create functional models which can be used to add efficiency to common workflows.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Assignments	70%	1-4
Tests	30%	1-4

Date: January 3, 2019

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