COURSE OUTLINE: NRT262 - ADVANCED GIS

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Course Code: Title	NRT262: ADVANCED GIS
Program Number: Name	5214: FISH/WILD CONSERVATN 5220: NAT ENVIRONMENT TN 5230: FORESTRY TECHNICIAN
Department:	NATURAL RESOURCES PRG
Academic Year:	2023-2024
Course Description:	This course builds upon the skills gained in NET108 (Geographic Information Systems). Geospatial topics such as satellite image acquisition and analysis, LIDAR data processing, and the raster data model will be explored. Throughout the course students will also perform change over time analyses and collection/utilization of data collected in the field.
Total Credits:	3
Hours/Week:	3
Total Hours:	42
Prerequisites:	There are no pre-requisites for this course.
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.**	**5214 - FISH/WILD CONSERVATN** VLO 1 Demonstrate clear, concise and industry appropriate written, spoken and visual communication skills VLO 10 Evaluate and apply current technologies and mathematical concepts used to collect, manage and analyze data. **5220 - NAT ENVIRONMENT TN** VLO 2 Utilize natural resources equipment and technology to accurately identify ecosystem components for purposes of conserving and managing natural resources. VLO 4 Conduct natural environment assessments according to standard field survey methods, including the use of appropriate equipment and materials. VLO 7 Work safely in adherence to occupational health and safety standards. VLO 9 Contribute to the implementation of natural resource conservation and management. VLO 10 Perform basic project management support techniques. VLO 11 Communicate technical information accurately and effectively in oral, written and visual forms. **5230 - FORESTRY TECHNICIAN** VLO 4 Collect, analyze, interpret, and display spatial data using mapping technology and Geographical Information Systems (GIS) to contribute to forest resource

		management.
	VLO 9	Communicate technical information to a variety of stakeholders in oral, written, visual and electronic forms.
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.
	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 A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.	
Other Course Evaluation & Assessment Requirements:	Academic success is directly linked to attendance. Missing more than 1/3 of the course hours in a semester shall result in an `F` Grade for the course.	

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
Demonstrate an understanding of remotely sensed data and how to utilize it in a GIS software environment.	1.1 Demonstrate ability to load composite images as well as individual satellite images. 1.2 Demonstrate the process of loading bands into different RBG colour guns. 1.3 Perform various raster processes on satellite imagery.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Integrate 2nd year field camp into a digital environment.	2.1 Create and populate geodatabase feature classes. 2.2 Customize and utilize appropriate symbology for collected features. 2.3 Use editing tools to create and modify real world features in a GIS environment.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Perform digital data collection using mobile devices and incorporate into a GIS software environment.	3.1 Investigate mobile data collection apps. 3.2 Collect spatial and attribute data in the field. 3.3 Map collected field data using GIS software.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Utilize LIDAR data to create and analyze value-added GIS datasets.	4.1 Explain the collection process of LIDAR data. 4.2 Demonstrate the ability to load and manipulate LIDAR data within ArcGIS Pro.

		4.3 Create DSMs and DTMs and Height rasters using LIDAR data.
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	Use ArcGIS Pro software to perform `Change over time` analyses using various vector and raster datasets.	5.1 Identify different types of change over time analysis. 5.2 Create datasets which can be used in change over time analysis. 5.3 Quantify change over time analysis results.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	85%
Quizzes	15%

Date: July 20, 2023

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