



## COURSE OUTLINE: NET204 - REMOTE SENSING

Prepared: Heath Bishop

Approved: Sherri Smith, Chair, Natural Environment, Business, Design and Culinary

<b>Course Code: Title</b>	NET204: REMOTE SENSING
<b>Program Number: Name</b>	5214: FISH/WILD CONSERVATN 5220: NAT ENVIRONMENT TN 5221: NAT ENVIRONMENT TY 5230: FORESTRY TECHNICIAN
<b>Department:</b>	NATURAL RESOURCES PRG
<b>Semesters/Terms:</b>	21F, 22W
<b>Course Description:</b>	This course deals with the usage of remotely sensed imagery, including satellite imagery and aerial photography. The theory of remote sensing will be discussed in detail, and a hands-on approach to image processing, measurement, feature identification and delineation using different platform data will be undertaken. Throughout the course, quantitative and qualitative uses of remotely sensed imagery and their application areas will be discussed, as they relate to various types of landcover.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	45
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Substitutes:</b>	NRT132, OEL244
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>5214 - FISH/WILD CONSERVATN</b> VLO 1 Demonstrate clear, concise and industry appropriate written, spoken and visual communication skills VLO 7 Recognize the contributions and applications of various science disciplines in the understanding of natural environments. VLO 10 Evaluate and apply current technologies and mathematical concepts used to collect, manage and analyze data.
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	<b>5220 - NAT ENVIRONMENT TN</b> VLO 2 Utilize natural resources equipment and technology to accurately identify ecosystem components for purposes of conserving and managing natural resources. VLO 10 Perform basic project management support techniques. VLO 11 Communicate technical information accurately and effectively in oral, written and visual forms.
	<b>5221 - NAT ENVIRONMENT TY</b>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.



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VLO 10 Communicate technical information accurately and effectively in oral, written, visual and electronic forms.

**5230 - FORESTRY TECHNICIAN**

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 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 course hours in a semester shall result in an F Grade for the course.

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
Demonstrate the ability to load, perform measurements and identify scale and direction on remotely sensed imagery using specialized software.	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 Explain the difference between satellite imagery and aerial photography. 1.4 Perform measurements on remotely sensed imagery. 1.5 Identify scale and direction on remotely sensed imagery.
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
Demonstrate an understanding of the remote sensing process, optical remote sensing and the electromagnetic spectrum.	2.1 Explain the workflow of remotely sensed data acquisition to analysis. 2.2 Describe the electromagnetic spectrum and how it relates to remote sensing. 2.3 Identify the imagery wavelength ranges of the electromagnetic spectrum.
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
Identify the importance and differences of wavelengths and image bands.	3.1 Differentiate between image bands and identify which band combinations are best used to identify certain features. 3.2 Identify and gain exposure to Panchromatic, RGB and NRG

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	band combinations.
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
Identify and explain different types of image resolution and various image sensors.	4.1 Differentiate and explain the different types of image resolution. 4.2 Demonstrate the ability to identify the resolution of an image using ArcGIS Pro. 4.3 Effectively work with various types of remotely sensed data using GIS software.
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
Demonstrate an understanding of image classification, landcover delineation and perform change over time analysis.	5.1 Explain image classification and be able to perform both supervised and unsupervised classification using ArcGIS Pro. 5.2 Use landcover classification to aid in the delineation process. 5.3 Identify change over time scenarios and demonstrate the ability to perform this process using GIS software.
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
Explain how LIDAR data is collected, and incorporate it into GIS software.	6.1 Explain the collection process of LIDAR data. 6.2 Demonstrate the ability to load and manipulate LIDAR data within ArcGIS Pro. 6.3 Create DSMs and DTMs using LIDAR data.
<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>
Demonstrate the ability to georeference and mosaic remotely sensed imagery while recognizing the role of topographic displacement.	7.1 Demonstrate the ability to collect GCPs and georeference imagery within a specified error tolerance. 7.2 Perform mosaicking operations on both aerial photography and satellite imagery.

<b>Evaluation Process and Grading System:</b>	<b>Evaluation Type</b>	<b>Evaluation Weight</b>
	Assignments	75%
	Exam	25%

**Date:** January 6, 2022

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

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