COURSE OUTLINE: NET204 - REMOTE SENSING

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

Course Code: Title	NET204: REMOTE SENSING
Program Number: Name	5214: FISH/WILD CONSERVATN 5220: NAT ENVIRONMENT TN 5221: NAT ENVIRONMENT TY 5230: FORESTRY TECHNICIAN
Department:	NATURAL RESOURCES PRG
Semesters/Terms:	18F, 19W
Course Description:	This course deals with both the quantitative uses of aerial photographs as well as the qualitative uses. Photogrammetric calculations will be studied. Distances, areas, & directions of target objects will be measured on hardcopy aerial photos and also using digital imagery. Tree species identification in both the Great Lakes - St. Lawrence forest region and the boreal forest region will be viewed stereoscopically on-screen. Remote sensing theory, platforms and applications will be discussed in detail.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	NRT132
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 7 Work safely in adherence to occupational health and safety standards. VLO 11 Communicate technical information accurately and effectively in oral, written and visual forms. **5221 - NAT ENVIRONMENT TY** 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.

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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 6 Locate, select, organize, and document information using appropriate technology and information systems. 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

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Account for topographic displacement when determining distances and directions on hardcopy aerial photographs.	1.1 Identify the different components that make up an aerial photograph. 1.2 Identify different types of hardcopy aerial photographs. 1.3 Identify the equation inputs for topographic displacement and solve vertical displacement problems. 1.4 Understand the differences between a map, a vertical photograph and a vertical ortho rectified image.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Accurately determine the scale of hardcopy aerial photographs for usage in distance measurements.	2.1 Understand and identify reasons for why scale is not constant within one hardcopy photo, and between sets of photos along a flight line. 2.2 Understand and calculate hardcopy photo scale using two differing methods. 2.3 Calculate the distance between two points on an aerial photograph.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Accurately determine directions on standard OMNR aerial photographs.	3.1 Utilize a navigational protractor with aerial photographs and topographical maps. 3.2 Establish directions and locations for field usage. 3.3 Successfully identify ÃƒÆ`Ã`Â¢ÃƒÂ¢`Ã`Â¬Ãƒ... tie in pointsÃƒÆ`Ã`Â¢ÃƒÂ¢`Ã`Â¬Ãƒ`Ã`Å□ used for access in the field. 3.4 Understand and minimize topographic displacement for use in plot location and field access.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Explain the foundations of optical remote sensing.	4.1 Identify and compare satellite sensors and their utility. 4.2 Describe the electromagnetic spectrum. 4.3 Describe energy interactions with earth surface features. 4.4 Locate different earth surface features on different band combinations using different satellite sensors. 4.5 Describe & discuss four (4) types of image resolution.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Demonstrate knowledge and understanding of digital	5.1 Describe the associated characteristics of both frame and scan-line sensors.

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	5.2 Identify and gain exposure to: Panchromatic, RGB, and NRG band combinations of ortho-imagery. 5.3 Understand and identify relationships between different image band combinations as they interact with features (vegetation, urban, water, barrenÃƒÆ`Ã`Â¢ÃƒÂ¢`Ã`Â¬Ãƒ`Ã`Â¦).
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Identify boundaries for non-forested features using OMNR eFRI and ELC specifications.	6.1 Gain some introductory exposure to Ecosite Land classification parameters. 6.2 Understand the automated water classification concept and methods used for quality control. 6.3 Differentiate between non-forested wetland features. 6.4 Classify non-forested urban features. 6.5 Identify & discuss natural vs. purposed disturbances.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Identify delineation boundaries of forested stands.	7.1 Differentiate conifer, hardwood and mixed wood stand types. 7.2 Recognize single and multitiered stands. 7.3 Identify plantations and natural regeneration. 7.4 Identify wetland species (conifer and deciduous). 7.5 Identify upland species (conifer and deciduous).

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Assignments	35%	all
Report	15%	all
Tests	50%	all

Date: June 19, 2018

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