

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE: Aerial Photographs / Remote Sensing

CODE NO. : NET204 **SEMESTER:** 4

PROGRAM: Natural Environment Technologist - Conservation and Management

AUTHOR: Gerard Lavoie

DATE: January, 2012 **PREVIOUS OUTLINE DATED:** Jan, 2011

APPROVED:

	<u>Brian Punch</u>	<u>December, 2011</u>
	CHAIR	DATE

TOTAL CREDITS: 3

PREREQUISITE(S): N/A

HOURS/WEEK: 3

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For additional information, please contact Brian Punch, Chair, Environment and Design School of Technology and Natural Resources
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I. COURSE DESCRIPTION:

This course will deal with both the quantitative use of aerial photographs as well as the qualitative use. Distances, areas, directions of objects will be measured. Tree species identification in both the Great Lakes-St. Lawrence forest region and the boreal forest region will be covered. Remote sensing platforms and applications will be discussed as will the digital aerial imagery system currently used by the Ontario Ministry of Natural Resources.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. **Account for topographic displacement when determining distances and directions on aerial photographs.**

Potential Elements of the Performance:

Identify the different components that make up an aerial photograph.
Identify different types of hardcopy aerial photographs.
Identify the equation inputs for topographic displacement and solve vertical displacement problems.
Understand the differences between a map, a vertical photograph and a vertical ortho rectified image.

2. **Accurately determine the scale of hardcopy aerial photographs for usage in distance measurements.**

Potential Elements of the Performance:

Understand and identify reasons for why scale is not constant within one hardcopy photo, and between sets of photos along a flight line.
Understand and calculate hardcopy photo scale using two differing methods.
Calculate the distance between two points on an aerial photograph.

3. **Accurately determine directions on standard OMNR aerial photographs**

Potential Elements of the Performance:

Utilize a navigational protractor with aerial photographs and topographical maps
 Establish directions and locations for field usage
 Successfully identify “tie in points” used for access in the field.
 Understand and minimize topographic displacement for use in plot location and field access.

4. **Explain the foundations of optical remote sensing**

Identify and compare satellite sensors and their utility.
 Describe the electromagnetic spectrum
 Describe energy interactions with earth surface features
 Locate different earth surface features on different band combinations using different satellite sensors.
 Describe the four (4) types of resolution

5. **Demonstrate knowledge and understanding of various digital aerial imagery types.**

Potential Elements of the Performance:

Describe the associated characteristics of both frame and scan-line sensors utilized by OMNR.
 Identify and gain exposure to: Panchromatic, RGB, and NRG band combinations of ortho-imagery.
 Understand and identify relationships between different image band combinations as they interact with features (vegetation, urban, water, barren...).

6. **Identify delineation boundaries for non-forested features using OMNR eFRI and ELC specifications.**

Potential Elements of the Performance:

Gain exposure to Ecosite Land classification parameters
 Understand water classification concept and methods used for quality control.
 Differentiate between non-forested wetland features.
 Classify non-forested urban features
 Identify natural vs. purposely disturbances

7. **Identify delineation boundaries of forested stands based on species composition, vertical structure and stage of development.**

Potential Elements of the Performance:

- Differentiate conifer, hardwood and mixed wood stand types.
- Recognize single and multi tiered stands.
- Identify plantations and natural regeneration
- Identify wetland species (conifer and deciduous).
- Identify upland species (conifer and deciduous).

III. TOPICS:

1. Topographic displacement
2. Measuring distances and directions
3. Aerial photo scale
4. Remote sensing
5. Digital aerial imagery
6. Earth feature recognition using the ELC approach

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Pocket stereoscope
2. Calculator
3. Metric scale (1:500 to 1:2500)
4. Masking tape
5. Black china marker or black grease pencil
6. 1:50 000 NTS topographic map sheet #41 K/9
7. Navigational Protractor

V. EVALUATION PROCESS/GRADING SYSTEM:

Lab assignments will make up **30%** of the final grade, with tests comprising **60%**. There will be three (3) tests throughout the semester, each worth 20%. A written report worth the remaining **10%** will be assigned at or near the beginning of the semester and due before the end of the course. There will be opportunities during the semester to assess the progress of the report. Regular attendance is necessary in order to succeed in this course as there is an abundant amount of learning material to cover.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
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)	< 50%	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.	

VI. SPECIAL NOTES:Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will generally not be granted admission to the room. This is out of respect for the other students and the professor. The usage of cell phones during class session is prohibited; please respect the learning environment by turning them off.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.