SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: Photogrammetry

CODE NO.: ^^^ ^^"^"^ SEMESTER: Two

PunPTl AM- Forestry/Fish & Wildlife Technician

AUTHOR: ^"^ ' ^ ^

DATE: ^^y ^^^^ PREVIOUS OUTLINE DATED: May 1997

APPROVED: 

DEAN ^DATE

TOTAL CREDITS

PREREQUISnE(S): none

LENGTH OF COURSE: 2 hours/week **TOTAL CREDIT HOURS:**

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PHOTOGRAMMETRY NRT104-4

COURSE NAME CODE NO.

I. COURSE DESCRIPTION: The aim of this course is to provide the student with basic knowledge and skills in the principles and techniques of vertical aerial photo photogranimetry, (distance, direction, area and photograph scale calculations) and interpretation (general cultural features and tree species identification) as it relates to natural resource applications.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1) Use the knowledge of the geometry of a vertical aerial photograph and account for topographic displacement when determining distances and directions on aerial photographs.

Potential Elements of the Performance:
- identify different types of aerial photographs
- give precise definitions for camera focal length and angle of coverage
- identify on an aerial photograph the fiducial marks, coordinate axes, and the three photo centers on a slighdy tilted aerial photograph
- list the various types of distortion and displacement that radiate from each photo center
- identify the different components of the equation for topographic displacement and be able to solve problems based on the equation

2) Accurately determine the scale of a single standard OMNR (Ontario Ministry of Natural Resources) aerial photograph in order to make distance and area measurements.

Potential Elements of the Performance:
- define photographic scale and list the three common methods of expressing scale
- identify two reasons why photo scale varies between photographs as well as within a single photograph
- list and use the two equations used to calculate photo scale
- use the correct equation to accurately determine the scale of a single OMNR aerial photograph
- use the imperial and metric scales to calculate the distance between two points on an aerial photograph
- use a dot grid and planimeter to calculate the size of an area on an aerial photograph and make additional calculations based on this size
- identify the camera focal length and the approximate aircraft flying height above mean sea level (amsl) for standard OMNR aerial photography

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

Potential Elements of the Performance:
- know how to use a navigational protractor
- be able to estabhsh a known direction (baseline) on an aerial photograph both indoors and outdoors
- minimize the effects of topographic displacement on plot locations and thereby accurately determining the direction of a line
- be able to-traverse outdoors from one point on an aerial photograph to another point

4) **Be able to delineate forest stand/cover types and identify** tree species.

Potential Elements of the Performance:
- imderstand the basic principles of aerial photo interpretation
- identify the important characteristics used to recognize individual tree species and cover types
- use deductive reasoning in order to identify tree species and cover types
- identify the categories of non-forested land, non-productive forest land and productive forest land on an aerial photograph
- delineate individual forest stands/cover types on OMNR aerial photographs
- identify the forest tree species/cover type present within a delineated stand

5) **Be able to measure tree heights/object heights on aerial photographs.**

Potential Elements of the Performance:
- be able to use the topographic displacement equation to determine heights of trees/objects on aerial photographs
- be able to use a parallax bar to determine heights of trees/objects on aerial photographs
- identify the components of a parallax bar
- identify the hmitations of usmg the topographic displacement equation for height measurement

6) **Transfer bouadaries delineated on an aerial photograph to a** map using **a Vertical Sketchmaster.**

Potential Elements of the Performance:
- explain the working principle of a Vertical Sketchmaster
- identify the components of a Vertical Sketchmaster
- be able to use a Vertical Sketchmaster to transfer line work from an aerial photograph to a paper/mylar copy map

7) **Be familiar with** the applications of satellite imagery and **CIR** (Color Infrared) film as **they apply to natural** resource management.

Potential Elements of the Performance:
- students should be familiar with basic sateUite image analysis techniques
- know the satellites and scanners which acquire natural resource images
- recognize the limitations of the various satellites/scanners
- know the applications of satellite images to natural resource management
- be familiar with the applications,of CIR film for natural resource management
- be able to identify healthy/unhealthy vegetation on CIR aerial photographs

III. TOPICS:

1. Geometry of a vertical aerial photograph.
2. Scale of a vertical aerial photograph.
3. Distance, direction and area on a vertical aerial photograph.
4. Vertical measurements on a vertical aerial photograph.
5. Tree species identification.
6. Stand typing.
7. The Vertical Sketchmaster.
8. CIR (Color Infi-ared) fihn and satelhte imagery

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IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Photogrammetry course manual
2. Pocket stereoscope
3. Calculator
4. Imperial scale (10 to 60 points)
5. Metric scale (i:500 to 1:2500)
6. Masking tape
7. 1:50 000 NTS topographic map sheet #41 K/9
8. Black china marker or black Stabilo grease pencil
9. Navigational protractor
10. Dot grid

V. ADDITIONAL RESOURCE MATERIALS IN THE COLLEGE LIBRARY:

Sayn-Wittgenstein, L. 1978. Recognition of tree species on aerial photographs. Forest Management Institute. Canadian Forestry Service. Information Report FMR-X-118.

Zsilinszky, V. G. 1966. Photographic interpretation of tree species in Ontario. Ontario Department of Lands and Forests.

Paine, D. P. 1981. Aerial photography and image interpretation for resource management. Forest Management Department, Oregon State'University, Corvallis, Oregon.

VI. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation will be based on lab assignments as well as written tests. Lab assignments will make up 25% of the final grade, with tests comprising the remaining 75%. There will be three (3) tests throughout the semester, each worth 25%. Regular attendance is necessary in that any student missing a lab assignment or test without a legitimate reason or prior notice will receive an "I" grade (incomplete) in that test or assignment. Students receiving "I" grades (incomplete) for three (3) tests and/or assignments will receive an "R" grade in the course.

A passing grade in this course is 60%. There will be no rewrite at the end of the semester. The instructor is available during non-class time for extra help (see the instructor).

The following letter grades will be assigned:

Grades:	A+	Consistently outstanding	90 -100%
	A	Outstanding achievement	80 - 89%
	B	Consistently above average	70 - 79%
	C	Satisfactory/acceptable	60 - 69%
	R	Repeat the course	

NOTE: Students can be assigned an "R" grade early in the course for unsatisfectory performance.

Vll. SPECIAL iNOTES:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204 (telephone extension 493, 717, or 491) so that support services can be arranged for you.

Students who engage in "academic dishonesty" will receive an automatic failure for that submission/test and/or such other penalty up to and including expulsion from the course, as may be decided by the professor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of the students. This may be due to the availability of equipment, transportation or a result of weather conditions.

Vin. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor.