Course Description: This course is designed to provide students with a working knowledge of the principles and applications of remote sensing as applied to field forestry and natural resource applications.

Meeting: 8:30am to 5:00pm M-W, FNRM Advanced Session at Cloquet Forestry Center

Instructor: Dr. Joe Knight  
Dept. of Forest Resources  
301-E Green Hall  
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Office hours: During class day or by appt.

Course Goals: Understand...
1. Provide experience in the use of satellite and aerial imagery to locate, in the field, such features as plot centers and legal description corners, and to identify common ground features by photo interpretation.

2. Acquaint students with the use of remote sensing imagery for vegetation classification and resource inventory.

3. Provide in-the-field experience in the preparation and interpretation of aerial photographs for vegetation mapping and multiphase forest inventory.

4. Introduce digital imagery, geographic information systems, geographical positioning systems and field computers along with providing practical experience in their use as tools for forest mapping and inventory.

Grading: Grades will be based on laboratory/field problems and an exam. Problems and reports will be evaluated on completeness, organization, accuracy and synthesis of material. Neatness, legibility, and correct grammar and spelling are expected.

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<tr>
<th>Problem</th>
<th>Description</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1</td>
<td>Development of photo key</td>
<td>25%</td>
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<tr>
<td>2</td>
<td>Photo Interpretation</td>
<td>25%</td>
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<tr>
<td>3</td>
<td>Forest Cover Type Mapping</td>
<td>50%</td>
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<td></td>
<td>Overall</td>
<td>100%</td>
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A -- achievement that is outstanding relative to the level necessary to meet course requirements.
B -- achievement that is significantly above the level necessary to meet course requirements.
C -- achievement that meets the course requirements in every respect.
D -- achievement that is worthy of credit even though it fails to meet fully the course requirements.
S -- achievement that is satisfactory, which is equivalent to a C- or better.
F (or N) -- Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an Incomplete.
I -- (Incomplete) Assigned at the discretion of the instructor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between instructor and student.

It is expected that in addition to the normal class hours, students be expected to spend additional time doing field work.

**Class Project Overview**
Student teams will plan and complete a course project. For FR 3262 students, several pre-organized projects will be available that provide pre-defined objectives (and for some, data). You will be responsible for planning an approach and accomplishing the objectives. FR 5262 students will be required to choose their own project topic and find their own data. Projects may focus on any natural resource issue so long as it requires the use of digital images or aerial photography in its completion. You are encouraged to propose a topic related to your present activities or interests.

The project has two main purposes. The first purpose is to provide an opportunity for you to apply the skills learned in the course. The second purpose is to give you experience in designing and carrying out a project from the initial idea phase to presentation of the results. The project includes a proposal, final written report, and a poster presentation.

Your project must include some usage of remotely sensed imagery or derivatives, either from a satellite, aerial, or ground platform. The imagery can be of any type, including optical, lidar, radar, or thermal. A project which uses aerial photographs or images, but which could be done as well without it is not a good choice. There are many free sources of imagery, which we will discuss in class. Please consult your instructor for other questions.

Groups are required to make an appointment to discuss their project with the instructor to ensure their project is appropriate given the objectives and limitations of a sixteen week course.

**Classroom Conduct**
All students at the University have the right to a civil, productive, and stimulating learning environment. In turn, instructors have a responsibility to nurture and maintain such an environment. Students who disrupt the educational process because of discourteous, threatening, harassing, or other aggressive behavior will be removed from class.
- Please arrive on time and stay the entire class period. If you must arrive late or leave early, please sit near the door and try to enter or exit quietly.
- Turn off or silence your electronic devices (e.g. cellphones, laptops) before class begins.
- If you use a computer during class, please refrain from using it for non-course-related activities, as this may distract other students.
- Avoid eating meals during class (drinks or light snacks are ok).

Absences and Late Policy
You are expected to be present for all class meetings. You are responsible for documenting the legitimacy of any absences. Legitimate absences include:
- illnesses certified by Boynton Health Service or your family physician
- emergencies caused by a death or serious illness in your immediate family
- participation in intercollegiate athletic events or other official University activities
- subpoenas, jury duty, military service, and religious observances
If you know that you will need to be absent on a particular day, let the instructor know beforehand. To retake an exam or submit a late assignment without penalty, you must provide documentation of your absence. Otherwise late assignments will be subject to a 25% penalty provided they are submitted within one week of the scheduled due date; late assignments will not be accepted after one week except in the case of a documented legitimate absence. There will be no makeup exams given without documentation.

Student Academic Integrity and Scholastic Dishonesty
You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.html). If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html. The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: http://www1.umn.edu/oscai/integrity/student/index.html. If you have further questions, please see the instructor.

Accommodations for Students with Disabilities
The University is committed to providing quality education to all students regardless of ability. Determining appropriate disability accommodations is a collaborative process. You as a student must register with Disability Services and provide documentation of your disability. The course instructor must provide information regarding a course's content, methods, and essential components. The combination of this information will be used by Disability Services to determine appropriate accommodations for a particular student in a particular course. For more
information, please reference Disability Services: http://ds.umn.edu/student-services.html.

**Student Mental Health and Stress Management**
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: http://www.mentalhealth.umn.edu.

**Sexual Harassment**
Sexual harassment means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: http://www1.umn.edu/regents/policies/humanresources/SexHarassment.html

**Equity, Diversity, Equal Opportunity, and Affirmative Action**
The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://www1.umn.edu/regents/policies/administrative/Equity_Diversity_EO_AA.html