WILD 5750/6750 - APPLIED REMOTE SENSING  
Fall Semester, 2017  
9:30am - 10:20am MW (Lecture - NR105), 1:30-2:50 W (Lab – Q306/304)  
9:30am – 10:20am F (Extended Office/Lab)

R. Douglas Ramsey - Instructor - 355a Natural Resources  
Office Phone - 797-3783; Office Hours - 10:30 - 12:00 MWF, or by Appt.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Aug./Sep 28, 30</td>
<td>Introduction to Digital Image Processing</td>
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<td>The Remote Sensing Process</td>
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<td>Remote Sensing Data Acquisition, Sensors</td>
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<tr>
<td>Sep. 6,8</td>
<td>Image Processing Systems, Scientific Visualization, Black and White vs. Color vs. Multispectral</td>
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<td>Sep. 11, 13</td>
<td>Color-Space Transforms, Data Fusion</td>
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<td>Image Statistics: Descriptive, Univariate, Multivariate</td>
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<td>Sep. 18, 20</td>
<td>Image Geometric Correction, Linear and polynomial transforms</td>
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<td>Sep 25, 27</td>
<td>Image Preprocessing, Image Enhancement, Image Reduction, Transects, Contrast Enhancements, Band Ratioing, Spatial Filters, PCA, NDVI, Texture</td>
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<td>Oct. 2, 4</td>
<td>Image Radiometric Corrections, Sensor Detector Error, Environmental Attenuation</td>
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<td>Oct. 9, 11</td>
<td>Image Transforms</td>
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<tr>
<td>Oct. 16, 18</td>
<td>Spectral Indices – Vegetation, Soils, etc.</td>
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<tr>
<td>Oct. 23, 25</td>
<td>Image Classification</td>
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<td>Oct./Nov. 30, 1</td>
<td>Supervised Classification, Unsupervised Classification,</td>
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<tr>
<td>Nov. 6, 8, 13, 15</td>
<td>Fuzzy Classification, Ancillary Data, Accuracy Assessment</td>
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<td>Nov. 20, 27, 29</td>
<td>Spectral Change Detection, Thematic Change</td>
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<td>Detection</td>
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<tr>
<td>Dec. 4, 6</td>
<td>GIS Linkages and Wrap-up.</td>
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Fall Semester 2017 Important Dates:
August 28..............Classes Begin  
September 4..............Holiday (Labor Day)  
October 20..............Fall Break (Friday Schedule on Thursday)  
November 22 - 24...........Holiday (Thanksgiving)  
December 8..............Last Day of Class
APPLIED REMOTE SENSING
WILD 5750/6750

GRADING POLICY

Grading will be based on class and lab assignments:

Weekly lab assignments will be given during the lab period and are due the following week unless I say otherwise. These assignments are worth 50 points. Grading will be for completeness, accuracy, and neatness.

In-class assignments will be given intermittently throughout the semester. The timing of these assignments will be somewhat random and will be worth 10 points each. These are due by the next class period unless I say otherwise.

Quizes will be given intermittently throughout the semester. These will be open book. Each quiz is worth 25 points.

A final project will be due on the last regular day of class. The topic of your project will be of your own choosing but must be cleared with me. This project is worth 200 points.

Each class or lab assignment will be turned in electronically (e-mail) on/or before class or lab on the due date. Late lab assignments will be assessed a 5-point fee for every day they are late. In class assignments will loose 1 point per day they are late. The final project will not be accepted late.

I will grade your assignments based on content, accuracy, clarity of writing, organization, and neatness.

COURSE MATERIALS:

USB DRIVE OR EXTERNAL DISK:
A USB drive or external hard disk is required. The Quinney labs no longer save your personal profile to the server. You will need to back up your work every day. There are cloud type options as well (Box, Drop Box) for backing up your work, and you can always email your work to yourself. But back it up, you must. Nothing is more painful (or educational) than having all of your data lost right before you turn it in.

CANVAS:
We will use Canvas for announcements, submitting assignments, and grade reporting. It is your responsibility to use the Canvas system. Questions about Canvas can be directed to the USU IT service desk (it.usu.edu, servicedesk@usu.edu, 435-797-4357).

EMAIL:
The best way to contact Doug is via e-mail. I will try to respond to e-mails on the same day and within no more than two working days (I hope).

SOFTWARE
We will use ArcGIS, which is available on all computers on the third floor of the Quinney Library. Student licenses are also available to install on personal computers through the USU site license web site. Contact Doug for an authorization code. We will
also use R (R Project for Statistical Computing), and optionally the Python programming language.

CLASS POLICIES

ATTENDANCE AND PARTICIPATION:
Attending each lecture and lab session is necessary to achieve a satisfactory grade in this course. If you miss class, it is your responsibility to obtain materials or notes from other students or Canvas.

LATE WORK AND MAKE-UP EXAMS
It is your responsibility to turn in all work on time. Grades for assignments will be reduced by 10 percent for each day late. No make-up exams or quizzes will be offered unless prearranged with the instructor or as a result of a documented emergency.

USE OF COMPUTERS, TABLETS, AND MOBILE PHONES
Turn off or silence phones during class. Computers and tablets may be used only for taking notes or activities directly relevant to lecture material during class (i.e. no Facebook, Twitter, Hulu, etc.). Students should respect the rights of others to learn and minimize the possibility of distraction from the use of electronic devices. If the use of electronics presents a distraction to others during class, the student will be asked to stop using the device. If issues persist, the student will be asked to leave the class.

ACADEMIC HONESTY
Students are expected to produce original work. Plagiarism or falsification of any kind will be subject to disciplinary action. Offences will be referred to Utah State University Admissions office. The USU policy for academic honesty can be found at: http://catalog.usu.edu/content.php?catoid=12&navoid=3140. Please review this document to understand the Utah State University policy on academic honesty. If you have questions or concerns about the policy, please contact your instructor or academic advisor.

PLAGIARISM
Plagiarism includes knowingly “representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged used of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.” The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, and denial or revocation of degrees.

STUDENTS WITH DISABILITIES
Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will require some accommodation by the instructor, the student must contact the Disability Resource Center (435- 797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor.
Final Project Report Standards  
Applied Remote Sensing  
WILD 5750/6750

The final project for this class will be delivered on the last day of class in Microsoft Word or PDF format. The final paper will be a minimum of 15 pages (including title page, references, tables, and figures.) All tables and figures will be numbered, captioned and placed within the text immediately after the first reference in the text (no more than a page after.) Figures can be of any type (color and/or B/W) but must be legible and represent the information in a manner consistent with the text description.

1. Title Page  
   a. Title of paper, authorship, class, and date

2. Abstract  
   a. Brief, ~250 word synopsis of your work. Abstracts are located at the beginning of the document, but written last.

3. Introduction  
   a. Sets the stage for the work, and provides a statement of objectives and/or hypothesis

4. Literature Review  
   a. A review of the pertinent literature that supports your work. Basically a linkage and interpretation of available literature written in your words – Can be combined with the Introduction.

5. Study Area  
   a. A factual description of the biophysical and geographic setting of your study site.

6. Methods  
   a. This section describes the methods and processes that you used to collect and interpret your data and the assumptions that you made relative to data collection and analysis. This section does not include basic descriptions of software commands (i.e. I don’t want to know which buttons you pushed on the computer)

7. Results  
   a. A factual representation of the quantitative and/or qualitative results from your analysis. Do not interpret the results just report them.

8. Conclusion/Discussion  

9. References  
   a. Citations of published or available manuscripts, web pages, etc., supporting your hypothesis, assumptions, methodology, and conclusions. These articles are cited using the following standard:
Citation Rules:
Primary author last name, first initials, First initials and last name of secondary authors. Date.
Paper or book title. Journal, proceedings, or book publisher that contained the work.
Volume(Issue):page numbers or number of pages (book).

Sample Journal Article:

Sample Book:

Graphics:
Graphics can be taken from the screen (screen-grab) or by exporting imagery and graphics to a standard image format like JPG’s, TIF’s, GIF’s, PNG, etc. Imagery like the one on the left should be stored as either a JPG, PNG, or a TIF. Line graphics like the one on the right should never be stored with JPG image format. Store these as TIF of GIF images. Line graphics or images with superimposed lines are notorious for losing resolution when they are resized to fit a space on the page. Make sure when you capture these type of graphics, they are the size that you want to display. Do not attempt to resize them.