

Geography 4725
Advanced Remote Sensing
Spring 2019

Instructor: **Dr. Craig Coburn**

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Office Hours: 11:00 – 12:00 Tuesday & Thursday

Laboratory Instructor: **Marcus Dostie**

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Lectures: TTR 8:00-9:15; Room WE2034

Laboratory: Lab 1 – Friday 8:00- 10:50; Room C757

Description:

Digital image analysis of aerial and satellite data for earth observation and studies of environmental and landuse change from local to global scales. Computer graphics and image processing in spatial, spectral and time dimensions. Data integration, classification, predictive models and fundamentals of spectroradiometry. Laboratory work will focus on digital image analysis software and applications. A lecture/laboratory instruction format will be used. There will be six extended laboratory assignments to familiarize students with important aspects of applied remote sensing.

Text Book:

Schowengerdt, R.A. 2007. Remote Sensing: Models and Methods for Image Processing, 3rd Edition. Academic Press. (NB: Text is available for rent or digital download).

Course Requirements:

Mid-Term Examination: 24%

Laboratory Exercises: 36% (6 exercises @ 6% each)

Final Examination: 40%

Late exercises will be penalized 10% per day late (excluding weekends). Missed laboratory exercises will result in a mark of zero if submitted after marked labs have been returned. All other academic regulations are clearly outlined in the Calendar and will be strictly enforced.

Final examinations will be held during the **examination period** and are scheduled at the beginning of the semester. Students are encouraged to make note of the final exam date as early as possible and ensure that they are able to attend the exam. All requests for changing dates of the final exam are made by the Dean of Arts and Science and must be requested in advance. Changes in the final exam schedule will only be accommodated in extraordinary cases (death in the family etc.).

As a courtesy to your fellow students, all cellular phones must be **turned off** during lectures (unless you have made prior arrangements with the professor). Electronic devices (cellular phones, blackberries, electronic organisers or other communication devices) are **not permitted** during examinations.

Prerequisite

Geog 3720

Grading Scale:

Grade	Range of Grand Total %	Grade	Range of Grand Total %
A+	90% and Above	C+	67% to 69%
A	85% to 89%	C	63% to 66%
A-	80% to 84%	C-	60% to 62%
B+	77% to 79%	D+	57% to 59%
B	73% to 76%	D	50% to 56%
B-	70% to 72%	F	Less than 50%

Lecture Outline (First 6 weeks are set – last six weeks are by student selection – so these are suggested only):

<i>Topic</i>	<i>Week</i>	<i>Exercise</i>	<i>Readings</i>
Introduction to Advanced Remote Sensing	1	No Lab	Ch. 1
Atmospheric Correction.	2	Atmospheric Correction	Ch. 2
Hyperpsectral RS	3		Ch. 4 + 9
Advanced Image Classification	4	Spectral Unmixing	Ch. 9
Advanced Image Classification	5		Ch. 9
Spatial Transformations.	6	Thermal Remote Sensing	Ch. 6
LiDAR RS.	7		Ch. 7
Image Enhancement and Manipulation	8	LiDAR RS	Ch. 5 + 6
Mid-term – Microwave Remote Sensing.	9		
Geostatistics and Texture.	10	Microwave RS	Ch. 4
Digital Change Detection	11		Ch. 9
Correction and Calibration	12	Change Detection	Ch. 7
Image Fusion – Temporal RS.	13		
Environmental Remote Sensing + Review.	13		