SYLLABUS--GEOGRAPHY (GEOG) 403 (U/G, 4 credits)
REMOTE SENSING: Environmental and Land Use Analysis
Spring 2018 (Revised)

Lecture: Tuesday-Thursday 11:00 a.m.-12:15 p.m. (LAP 253)
Lab: EITHER W, 1:00-2:50 p.m. or R at 2:00-3:50 p.m. (BOL 262/277 or BOL 289)
Instructor: Prof. Mark D. Schwartz, Ph.D. Email: mds@uwm.edu
Office: BOL 490 -- messages may be left in BOL 410 (Geography Department)
Office Phone: 414-229-3740 Messages: 414-229-4866 (Geography Department)
Office Hours: by appointment only
Class Reflector: geog-403@uwm.edu
Required Text: Jensen, *Remote Sensing of the Environment*, 2nd ed., P/P. Hall, 2007.
Materials: see Lab syllabus

This course is designed to explore basic applications of remotely-sensed data in the evaluation of geographical problems. Material regarding the theories and principles of remote sensing, types of sensors, and analysis of remote sensing data will be addressed, along with specific applications to atmospheric, geophysical, biological, and cultural patterns. In addition, the student will become familiar with image processing functions of the TerrSet/IDRISI software, and be introduced to ERDAS IMAGINE (advanced image processing software). More information is available at https://people.uwm.edu/mds/geography-403/

COURSE POLICIES

1. Evaluation (undergraduates and graduates will be evaluated separately) *UNDERGRADUATES*: Grades will be assigned on the basis of the total points accumulated from tests, lab exercises, and discussion/participation throughout the semester (530 possible). These will consist of 3 equally weighted exams (100 points each), lab exercises (total of 200 points), and discussion/participation, including lecture attendance (total of 30 points).
GRADUATE STUDENTS: In addition to the above requirements, graduate students will prepare a 10 page (2500 word minimum) paper with at least one publication quality color figure on a project using remote sensing in a geographic application, and a short talk (about 10 minutes) about their project that will be presented to the class. These will be worth 50 and 20 points, respectively. Therefore graduate students will be graded based on 600 points.

The percentages necessary to receive certain grades will be no higher than the following:

88%--(A-) 78%--(B-) 68%--(C-) 58%--(D-)

2. Notices: Grades, once given, are final except in cases of clerical error. Do not use a red pencil or pen to write exam answers. All tests must be taken as scheduled; make-ups are given in case of documented student illness or other emergency only. It is the responsibility of the student to notify the instructor when an exam or other course requirement will be missed. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible. Do your own work...plagiarism and cheating are unacceptable and will not be tolerated. Additional information regarding the policies and procedures applicable to this course are available on-line (http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf) and posted in the Geography Dept. main office, BOL410. In the event of disruption of normal classroom activities, the format for this course may be modified to enable completion of the course. In that event, you will be provided an addendum to this syllabus that will supersede this version.

TENTATIVE LECTURE SCHEDULE and Readings

		Text Chapters (Jensen)
Jan.	23-T-Introduction and course procedures	
	Basics and History of Remote Sensing	1,3
	25-R-Cameras, Films, and Filters	4
	Characteristics of Images and Scale	
	Fundamentals of Image Interpretation	5
	30-T-Fundamentals of Image Interpretation *(continued)*	6
Feb.	1-R-Fundamentals of Image Interpretation *(continued)*	
	Applications of Aerial photographs	
	6-T-Electromagnetic Radiation and Radiation Laws	2 (pp.37-47)
	8-R-Radiation, Emission, and Reflection	2 (pp.47-60)
	13-T-Satellite Basics	15
	15-R-LANDSAT Thematic mapper and SPOT	7
	20-T-Introduction to Windows and TerrSet/IDRISI	
	22-R-EXAM ONE	
	27-T-Review Exam One, Image Processing with TerrSet/IDRISI	
Mar.	1-R-Image Processing with TerrSet/IDRISI *(continued)*	
	6-T-Image Processing with TerrSet/IDRISI *(continued)*	
	8-R-Passive Scanners, Thermal and Microwave	8
	13-T-Radar, SLAR, and LIDAR	9, 10
	15-R-Geographic Information Systems and Image Georegistration	
	*20-T and 22-R-**NO CLASS--SPRING BREAK***	
	27-T-Introduction to ERDAS	
	29-R-Introduction to ERDAS *(continued)*	
Apr.	3-T-Weather and Climate Applications	12 (pp.427-437)
	5-R-EXAM TWO	
	10-T-High Res. Applications using a digital camera (Guest Lecture)	
	12-R-Archaeological Applications (Guest Lecture)	
	17-T-Review Exam Two, Weather and Climate Applications *(continued)*	
	19-R-Weather and Climate Applications *(continued)*	
	24-T-Agricultural, Forestry, and Resource Applications	11
	26-R-Urban Applications (Guest Lecture)	13
May	1-T-Geological Applications (Guest Lecture)	14 (pp.507-566)
	3-R-Limnological Applications	12 (pp. 409-427, 437-439)
	8-T-Graduate Student Presentations	
	10-R-Graduate Student Presentations, Course Review and Evaluations	
	12-SATURDAY-EXAM THREE- 7:30 a.m. - 9:30 a.m.	

Laboratory Schedule

Note: Lab meetings are in BOL 289 unless otherwise noted!

January 24-25-No labs this week

31- Feb. 1-Lab #1 Introduction to Image Interpretation. (**BOL 262/277**, 10 points)

February 7- 8-Lab #2 Air Photos as Quantitative Data (**BOL 262/277**, 25 points)

14-15-Lab # 2 continued (**BOL 262/277**)

21-22-Lab #3 E-M Emission and Multi-spec. Reflect. (**BOL 262/277**, 15 points)

28- March 1-Lab #4 Introduction to IDRISI (20 points)

March 7- 8-Lab #5 Image Processing with IDRISI (30 points)

14-15-Lab #6 Thermal and Microwave Remote Sensing (15 points)

*21-22-**NO CLASS--SPRING BREAK***

28-29-Open Labs this week

April 4- 5-Lab #7 GIS applications (20 points)

11-12-Lab #8 Urban and Land Use (20 points)

18-19-Lab #9 Weather and Climate (15 points)

25-26-Lab #10 Agriculture and Forestry (15 points)

May 2- 3-Lab #11 Geology and Soils (15 points)

9-10-Open Labs this week