

**SYLLABUS--GEOGRAPHY (GEOG) 403 (U, 4 credits)**  
**REMOTE SENSING: Environmental and Land Use Analysis**  
**Spring 2022 (1/16/2022 edition)**

Lecture: Tuesday-Thursday 11:00 a.m.-12:15 p.m. (BOL 281)  
Lab: EITHER W, 2:00-3:50 p.m. or R at 2:00-3:50 p.m. (BOL 262 or MIT 353)  
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-403704@uwm.edu

**Required Text:** Jensen, *Remote Sensing of the Environment*, 2<sup>nd</sup> 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: Grades will be assigned based on 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 (total of 30 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 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.

3. Average student's investment of time to achieve learning goals of the course (190 hours).

This total is made up of the following:

General preparation and study: 100 hours

Lectures and Exams: 40 hours

Lab Assignments: 50 hours

**TENTATIVE LECTURE SCHEDULE and Readings**

**Text Chapters (Jensen)**

Jan.	25-T-Introduction and course procedures	
	Basics and History of Remote Sensing	1,3
	27-R-Cameras, Films, and Filters	4
	Characteristics of Images and Scale	
	Fundamentals of Image Interpretation	5
Feb.	1-T-Fundamentals of Image Interpretation ( <i>continued</i> )	6
	3-R-Fundamentals of Image Interpretation ( <i>continued</i> )	
	Applications of Aerial photographs	
	8-T-Electromagnetic Radiation and Radiation Laws	2 (pp.37-47)
	10-R-Radiation, Emission, and Reflection	2 (pp.47-60)
	15-T-Satellite Basics	15
	17-R-LANDSAT Thematic mapper and SPOT	7
	22-T-Introduction to Windows and TerrSet/IDRISI	
	<b>24-R-EXAM ONE (online 11:00-12:30 through class CANVAS page)</b>	
Mar.	1-T-Review Exam One, Image Processing with TerrSet/IDRISI	
	3-R-Image Processing with TerrSet/IDRISI ( <i>continued</i> )	
	8-T-Image Processing with TerrSet/IDRISI ( <i>continued</i> )	
	10-R-Passive Scanners, Thermal and Microwave	8
	15-T-Radar, SLAR, and LIDAR	9, 10
	17-R-Geographic Information Systems and Image Georegistration	
	<b>22-T and 24-R-NO CLASS--SPRING BREAK</b>	
	29-T-Introduction to ERDAS	
	31-R-Introduction to ERDAS ( <i>continued</i> )	
Apr.	5-T-Weather and Climate Applications	12 (pp.427-437)
	<b>7-R-EXAM TWO (online 11:00-12:30 through class CANVAS page)</b>	
	12-T-Archaeological Applications (Guest Lecture)	
	14-R-Geosciences/Terroir Applications (Guest Lecture)	
	19-T-Review Exam Two, Weather and Climate Applications ( <i>continued</i> )	
	21-R-Weather and Climate Applications ( <i>continued</i> )	
	26-T-Agricultural, Forestry, and Resource Applications	11
	28-R-Urban Applications (Guest Lecture)	13
May	3-T-High Res. Applications using a digital camera (Guest Lecture)	
	5-R-Soils and Geology Applications	14 (pp.507-566)
	10-T-Graduate Student Presentations	
	12-R-Graduate Student Presentations	
	<b>19-THURSDAY-EXAM THREE (online 10:00-12:00 through class CANVAS page)</b>	

### Laboratory Schedule

*Note: Lab meetings are in MIT 353 unless otherwise noted!*

January	26-27-No labs this week
February	02-03-Lab #1 Introduction to Image Interpretation. ( <b>BOL 262</b> , 10 points)
	09-10-Lab #2 Air Photos as Quantitative Data ( <b>BOL 262</b> , 25 points)
	16-17-Lab # 2 continued ( <b>BOL 262</b> )
	23-24-Lab #3 E-M Emission and Multi-spec. Reflect. ( <b>BOL 262</b> , 15 points)
March	02-03-Lab #4 Introduction to IDRISI (20 points)
	09-10-Lab #5 Image Processing with IDRISI (30 points)
	16-17-Lab #6 Thermal and Microwave Remote Sensing (15 points)
	<b>23-24-NO CLASS--SPRING BREAK</b>
	30-31-Open Labs this week
April	06-07-Lab #7 GIS applications (20 points)
	13-14-Lab #8 Urban and Land Use (20 points)
	20-21-Lab #9 Weather and Climate (15 points)
	27-28-Lab #10 Agriculture and Forestry (15 points)
May	04-05-Lab #11 Geology and Soils (15 points)
	11-12-Open Labs this week

## COVID-19 SYLLABUS STATEMENTS

### SPRING 2022

**Panther Community Health and Safety Standards:** UWM has implemented reasonable health and safety protocols, taking into account recommendations by local, state and national public health authorities, in response to the COVID-19 pandemic. As a member of our campus community, you are expected to abide by the Panther [Interim COVID-Related Health & Safety Rules](#), which were developed in accordance with public health guidelines. These standards apply to anyone who is physically present on campus, UWM grounds, or participating in a UWM-sponsored activity:

- All individuals visiting UWM facilities must wear face coverings while indoors;
- A student who comes to class without wearing a mask will be asked to put on a mask or to leave to get one at a mask handout station. Failure to do so could result in student discipline;
- Unvaccinated students coming to campus are required to test weekly for COVID-19;
- You should check daily for COVID-19 symptoms and not come to campus if you are feeling sick; and,
- If you test positive for or are diagnosed with COVID-19 based on symptoms, you should complete this Dean of Students Office form: [https://cm.maxient.com/reportingform.php?UnivofWisconsinMilwaukee&layout\\_id=4](https://cm.maxient.com/reportingform.php?UnivofWisconsinMilwaukee&layout_id=4) By doing so, you will get information on resources, help UWM identify individuals you may have come into contact with on campus so that UWM can work with the local health department, and allow UWM to clean campus areas you visited as appropriate.

Additional details about student and staff expectations can be found on the [UWM COVID-19 webpage](#).

#### **Attendance Policy**

*Do not attend class if you have COVID-19, if you are experiencing symptoms consistent with COVID-19, if you have been in close contact with others who have symptoms, if you need to care for an individual with COVID-19, or have other health concerns related to COVID-19.*

- In case of illness, you should contact me immediately to discuss options for completing course work while ill;
- Notify me in advance of the absence or inability to participate, if possible;
- Participate in class activities online and submit assignments electronically, to the extent possible;

- Reach out to me if illness will require late submission or other modifications to deadlines; and,
- If remaining in a class and fulfilling the necessary requirements becomes impossible due to illness, contact me to discuss other options.

As your instructor, **I will trust your word** when you say you are ill, and in turn, **I expect that you will report the reason for your absences truthfully.**

**Face-to-Face Class Recording (Lecture Capture)**

Our in-person (lecture only) class sessions will be audio-visually recorded (using Lecture Capture software) for students who are unable to attend in person and for students who are unable to attend at the scheduled time. Students who participate during an in-person class session are agreeing to have their audio/video or image recorded. Lecture recordings will be made accessible through the class Canvas page.

**Potential for Reversion to Fully Online Instruction**

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