SYLLABUS (12-29-22 version)
GEOGRAPHY 804 –*ADVANCED REMOTE SENSING* (3 credits)
Spring 2023

Time: *Wed., 5:30-8:10p.m. Class reflector: geog-804@uwm.edu
Instructor: Prof. Mark D. Schwartz Room: Online w/Teams (or in-person BOL 475/B84)
Office: BOL 490 -- messages may be left in BOL 410 (Geog. Dept.)
Office Phone: 229-3740 Messages: 229-4866 (Geog. Dept.)
Office Hours: by appointment only
*Not all weeks will have synchronous meetings; those that do will be from 5:30-7:00p.m.

Textbook: Jensen, J. R., *Introductory Digital Image Processing*, 4th Ed. (2015), Prentice Hall.
Readings: Additional readings may be assigned on topical issues.
Software needed on student PCs: Microsoft Teams, PowerPoint, and WORD
Students will be assigned to a remote computer resource to access ERDAS IMAGINE software.

This course is designed to follow on from basic concepts of digital image analysis addressed in GEOG 403/704 *Remote Sensing: Environmental and Land Use Analysis* or similar courses. Students will develop competency in using ERDAS IMAGINE software. Topics will include data import and geo-linking, image enhancement and georegistration, unsupervised classification, resolution merging, supervised classification, hybrid classification, classification of mixed pixels, atmospheric correction, and vector integration. Understanding of these technical issues and procedures will be interleaved with practical examples of their application to geographic problems, which students will explore through exercises and a final project. Students will choose a topic of interest, formulate and present an outline of their strategy and methodology, and then prepare a written final report of the project, including an in-class graphically-supported presentation.

COURSE POLICIES

1. Evaluation: Grades will be assigned based on total points accumulated from general participation and exercises (100 points), the final report (40 points) and presentation (20 points), and a "take-home" final exam (40 points) for a total of 200 points.
The percentages necessary to receive certain grades will be no higher than the following:

88%--(A-)
78%--(B-)

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 you 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://www4.uwm.edu/secu/SyllabusLinks.pdf) and posted in the Geography Dept. office, BOL 410. In the event of disruption of normal classroom activities, the format for this course may be modified to enable completion of the course. Weapons are banned in UWM campus buildings.

LEARNING OUTCOMES

Through this course, students are expected to achieve the following: 1) practical understanding of geographic approaches to remote sensing applications in various fields, including vegetation, urban, soil, etc.; 2) mastery of basic remote sensing image processing techniques using ERDAS software; 3) awareness of advanced remote sensing image processing techniques; and 4) basic understanding of approaches to selecting the best analysis technique for a particular remote sensing application.

Average student's investment of time to achieve learning goals of the course (155 hours).
This total is made up of the following:
General preparation and study: 70 hours
Lectures and Exam: 40 hours
Assignments: 45 hours

TENTATIVE SCHEDULE	**READINGS**
(J = Jensen Chapter)	
Jan. 25-W-Introduction, procedures, and technical issues (**meet in BOL 475**)	
Feb. 1-W- IMAGINE Orientation1*	J1&2
8-W-IMAGINE Orientation 2*	J3&4
15-W-IMAGINE Orientation 3*	J7&8
22-W-IMAGINE Orientation 4*	J5&6
Mar. 1-W-IMAGINE Orientation 5*	J9
8-W-Georegistration/Image Enhancement	J10&11
15-W-Atmospheric Correction	J12&13
22-W-NO CLASS, SPRING BREAK*	
29-W-Classification 1	
Apr. 5-W-Classification 2	
12-W-High-resolution, land surface, and landscape phenology	
19-W-Outline presentations (**this & remaining classes may be in-person in BOL B84**)	
26-W-Outline presentations	
May 3-W-Report presentations	
10-W-Report presentations, Take-home exam distributed (last class meeting)	
12-F-Final Report due by 5:00 p.m.	
17-W-Take-home exam due by 5:00 p.m.	

* No Synchronous lecture this week
All Synchronous TEAMS lectures will be recorded and made available for review on the class Canvas page.