ESCI 4170/5170

FUNDAMENTALS OF REMOTE SENSING

Timetable: Fall 2014
Lecture: Monday, Wednesday 9:30 – 10:45 am McEniry 431
Lab: Friday 8:00 – 10:45 am McEniry 431

Instructor:
Dr. Gang Chen
Office: McEniry 304
Office Hours: Monday, Wednesday, 11:00 am – 12:00 pm or by appointment
Phone: 704-687-5947
Email: gang.chen@uncc.edu

Teaching Assistant:
n/a

Course Description:
This course introduces the physical fundamentals of remote sensing, provides an overview of airborne and satellite remote sensing systems, and offers a basic instruction in the use and interpretation of remote sensing imagery. Identification, interpretation and mapping of both natural and cultural landscape features will be covered.

Course Objectives:
1. Develop an understanding of the basic principles of remote sensing;
2. Gain practical skills of interpreting remote sensing imagery; and
3. Analyze remote sensing data quantitatively with state-of-the-art techniques and software packages.

Prerequisite:
ESCI 1101 and ESCI 1101L or GEOL 1200 and GEOL 1200L, OR permission of instructor (email instructor).

Reference Materials:

No Required Textbook:

Recommended Textbooks:
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<th>WK</th>
<th>DATE*</th>
<th>CONTENT</th>
<th>LAB</th>
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| 1  | Aug 18-Aug 20 | - Course Introduction and Overview  
- Foundations of Remote Sensing | N/A |
| 2  | Aug 25-Aug 27  | - Color Theory, Multiband Images, Contrast Enhancement  
- Color Theory, Multiband Images, Contrast Enhancement | Lab 1: Aug 29  
Multiband Images, Color Compositing, and Contrast Enhancement |
| 3  | Sep 01-Sep 03  | - No Class – Labor Day  
- Electromagnetic Radiation Principles | Hand in Lab1 at the start of Lab2 |
| 4  | Sep 08-Sep 10  | - Electromagnetic Radiation Principles  
- Radiometric Correction | Hand in Lab2 at the start of Lab3 |
| 5  | Sep 15-Sep 17  | - Radiometric Correction  
- Geometric Correction | Lab 2: Sep 26  
Image Rectification and Data Integration |
| 6  | Sep 22-Sep 24  | - Geometric Correction  
- Satellite Sensor Systems | Hand in Lab3 at the start of Lab4 |
| 7  | Sep 29-Oct 01  | - Satellite Sensor Systems  
- Midterm Exam | Lab 3: Oct 17  
Image Transformations and Interpretation |
| 8  | Oct 06-Oct 08  | - No Class – Student Recess  
- Image Transformations | Hand in Lab3 at the start of Lab4 |
| 9  | Oct 13-Oct 15  | - Image Transformations  
- Vegetation Remote Sensing | Lab 4: Nov 07  
Image Classification |
| 10 | Oct 20-Oct 22  | - Vegetation Remote Sensing  
- Spatial Filtering and Texture Analysis | Hand in Lab4 at the start of Lab5 |
| 11 | Oct 27-Oct 29  | - Spatial Filtering and Texture Analysis  
- Image Classification | Lab 5: Nov 21  
Change Detection |
| 12 | Nov 03-Nov 05  | - Image Classification  
- Accuracy Assessment | Hand in Lab5 on Dec 04 |
| 13 | Nov 10-Nov 12  | - Accuracy Assessment  
- Change Detection |  |
| 14 | Nov 17-Nov 19  | - Change Detection  
- Lidar (*light detection and ranging*) Basics |  |
| 15 | Nov 24-Nov 26  | - Lidar Basics  
- No Class - Thanksgiving Break |  |
| 16 | Dec 01-Dec 03  | - Object-based Image Analysis for High-resolution Imagery  
- Course Review |  |
| 17 | Dec 10         | - Final Exam (Wednesday, 8:00 – 10:30am in McEniry 431) | N/A |

* This schedule is subject to minor adjustments as necessary.
Grading (weighted)

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<tr>
<td>Class Participation</td>
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<td>Lab 1</td>
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<td>Final Exam</td>
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**NOTE:** It is not essential to pass all components in order to pass the course as a whole.

Grading System:

90-100 A  80-89 B  70-79 C  60-69 D  0-59 F

University Policies:

**Academic Integrity:** Students are responsible for knowing and following The UNCC Code of Student Academic Integrity [http://www.legal.uncc.edu/policies/ps-105.html](http://www.legal.uncc.edu/policies/ps-105.html) and The UNCC Code of Student Responsibility [http://www.legal.uncc.edu/policies/ps-104.html](http://www.legal.uncc.edu/policies/ps-104.html) in all aspects of their work in this course. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity of academic dishonesty. Standards of academic integrity will be enforced in this course. Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Questions regarding the policies and enforcement of the policies may be addressed to me during class or during office hours. Students are expected to report cases of academic dishonesty to the course instructor.

**Accommodations:** UNCC abides by interpretations of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 that stipulates no student shall be denied the benefits of an education “solely by reason of a handicap.” Disabilities covered by law include, but are not limited to, learning disabilities, hearing, sight or mobility impairments, and other health related impairments. This course will gladly provide accommodations for students with documented needs. If you feel you need an accommodation, please contact the Office of Disability Services, Fretwell 230, Phone: 704-687-4355 for the necessary evaluation and documentation.